

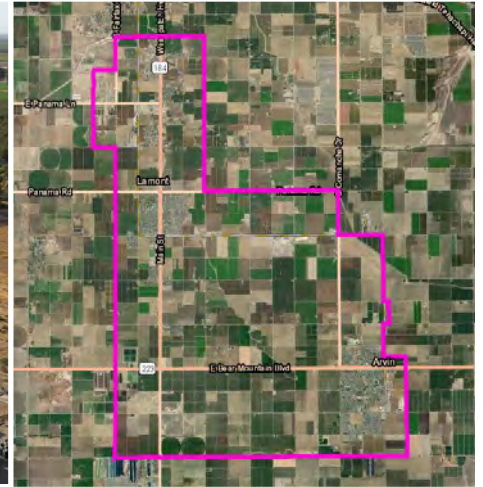
Exhibit A.

Arvin/Lamont CERP

Community Emissions Reduction Program

Arvin/Lamont

June 16, 2022



San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

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EXECUTIVE SUMMARY

Since 1992, the San Joaquin Valley Air Pollution Control District (District) has adopted and amended nearly 650 rules and regulations to control air pollution in the Valley Air Basin. Numerous plans to improve Valley air quality and attain state and federal air quality standards have detailed a wide-range of regulatory measures and extensive incentive investment to promote clean-air technologies. Several first-of-their-kind measures have been implemented to accelerate emissions reductions and improve Valley air quality, such as the nationally recognized Tune-in-Tune Up vehicle repair program serving low-income residents. The District also has dedicated field staff in communities throughout the Valley conducting compliance inspections and responding to community complaints and concerns to ensure that Valley businesses and residents are complying with federal, state, and local rules and regulations.

As a result of the District's stringent and comprehensive air quality management strategy, along with significant investments made by Valley businesses and residents, particulate matter of 2.5 microns or less (PM_{2.5}) and ozone levels are now at historically low levels. Emissions from stationary sources have been reduced by 85%, cancer risk from exposure to air pollutants has been reduced by 95%, population exposure to elevated PM_{2.5} levels have been reduced by 85%, and population exposure to elevated ozone levels have been reduced by 90%.

Despite these regional air quality improvements, some low-income and disadvantaged communities throughout the state are more likely to be affected by localized and regional impacts of air pollution. In answer to that concern, Assembly Bill (AB) 617, signed into law in July 2017, initiated a statewide effort to monitor air quality, reduce air pollution, and improve public health in communities that experience disproportionate burdens from exposure to air pollutants. Valley residents and the District Governing Board prioritized and nominated the community of Arvin/Lamont for AB 617 selection in year two and year three of AB 617. The Arvin/Lamont community was subsequently selected by the California Air Resources Board (CARB) as one of two new communities statewide selected in year three to receive clean air resources available under AB 617.

AB 617 provides mechanisms and resources to implement community-specific air quality monitoring networks; to develop, implement, and track emission reduction programs; to improve availability of data and other technical information; and to invest substantial funding in the community through voluntary incentives measures. Importantly, these measures are guided by advice and knowledge of community members, through their input and involvement on Steering Committees for each AB 617-selected community.

This Community Emissions Reduction Program (CERP) provides a description of the community of Arvin/Lamont AB 617 Community, which includes the City of Arvin and unincorporated Kern County communities of Lamont, Weedpatch, and Fuller Acres. A technical analysis describes the sources of pollution affecting the community and location of sensitive receptors relative to those sources. Strategies for reducing air pollution impacts from sources of pollution that are of particular concern to community members were developed in partnership with the Community Steering Committee

(CSC), the District, and CARB.

Working closely together as a unified partnership, the CSC developed numerous strategies that were ultimately refined and supported by the community for implementation in Arvin/Lamont, including incentive funding measures, public engagement strategies, enforcement strategies, and regulatory strategies. Many of the strategies will require close collaboration with state and local organizations and community based organizations to ensure meaningful implementation. Also included in this CERP are the necessary metrics for tracking emission reductions and other commitments within the community. The metrics for tracking progress will be included in regular updates to the CSC during ongoing meetings, annual reporting, and at the five-year milestone.

The Arvin/Lamont CSC unanimously supported adoption of this CERP during the June 6, 2022 official CSC meeting. This CERP anticipates investing over \$30 million in emission reduction incentives, and a variety of other clean air projects in the Arvin/Lamont AB 617 Community area. All 31 measures are projected to reduce approximately 136 tons of PM_{2.5}, 421 tons of NO_x, and 161 tons of VOCs in Arvin/Lamont, as well as significant reductions in air toxics emissions in the community, particularly with respect to diesel particulate matter from mobile sources, the main contributor to community air toxics health risk. Additional regulatory and outreach strategies will provide for further reductions in emissions and exposure, while increasing awareness of the community's air quality challenges and the resources available to help the public and businesses reduce emissions and avoid exposure to air pollution.

In the preparation of this CERP, the District has worked closely with the CSC, CARB, and the public. The CSC includes residents, community-based organizations, community members, environmental organizations, regulated industry representatives, local agencies, and other key stakeholders and worked to develop strategies and an implementation plan to reduce harmful air pollutants in the community of Arvin/Lamont AB 617 Community. The plan developed through this collaborative process employs proven and innovative strategies and significant resources, to improve community health by reducing exposure to air pollutants in the Arvin/Lamont community.

This CERP, and the many air quality improvement strategies it includes, would not be possible without the tremendous commitment and effort shown by Arvin/Lamont Community Steering Committee members. This engaged group of individuals includes area residents; representatives from community organizations; owners and employees from businesses operating within the community; the City of Arvin; Kern County, including the Planning and Natural Resources Department, Public Works Department, and Agriculture and Measurement Standards Department; and others. Additionally, CARB staff and members of state and local agencies including the Kern Council of Government and California Department of Transportation have also provided information and guidance to assist the CSC members in the development of the air quality improvement strategies in this CERP. Lastly, Harder + Company Community Research and Linguistica Interpreting and Translation are recognized for the excellent meeting facilitation, interpretation, and support services they provided to guide this process.

1. INTRODUCTION

1.1. IMPLEMENTATION OF AB 617 IN ARVIN/LAMONT AB 617 COMMUNITY

The implementation of Assembly Bill (AB) 617 (C. Garcia, Chapter 136, Statutes of 2017) has brought additional clean air resources and strategies to Valley environmental justice communities that have been and are currently disproportionately burdened by socioeconomic disadvantages and air pollution, despite significant emissions reductions that have already been achieved regionally.

AB 617 provides mechanisms and resources to adopt expedited schedules for the implementation of advanced control technologies for existing stationary source facilities; increased stringency of reporting requirements for stationary sources; develop and implement community-specific air quality monitoring networks; implement, and track localized emission reduction programs; improve availability of data and other technical information; and invest substantial funding in the community through voluntary incentive funding measures.

Resources available through this legislation allowed the San Joaquin Valley Air Pollution Control District (District), working in partnership with the Arvin/Lamont AB 617 Community Steering Committee (CSC), through a comprehensive public outreach and community engagement process, to expand regional programs for community protection and develop a robust plan for reducing local exposure to various forms of air pollution including fine particulate matter and toxic air contaminants in the Arvin/Lamont AB 617 Community.

Several requirements of AB 617 will serve to reduce air pollution in disadvantaged communities throughout the San Joaquin Valley. AB 617 legislation required districts that are in nonattainment for one or more air pollutants to adopt expedited rule review schedules, by January 2019, for the implementation of Best Available Retrofit Control Technology (BARCT). The District Governing Board adopted this schedule at a public hearing held in December 2018, which set the path forward for the District to research and potentially amend applicable rules. The expedited BARCT implementation schedule is discussed in more detail later in this document.

Additionally, AB 617 requires "Stationary Sources" as defined by CARB to report their criteria pollutant emissions inventory as well as their air toxics emissions inventory to the State on an annual basis. These emissions inventories will be presented via the Criteria Pollutant and Toxics Emissions Reporting regulation, once fully implemented by California Air Resources Board (CARB).

The District has worked closely with CARB, regulated entities, and other stakeholders to implement this new reporting requirement in the Valley. Further information on the implementation of the AB 617 stationary source criteria pollutant emissions inventory reporting requirement is available at: <https://ww2.arb.ca.gov/our-work/programs/criteria-and-toxics-reporting>.

COMMUNITY SELECTION

The District's community identification and prioritization analysis for the third year of AB 617 implementation was based on extensive air quality analysis, numerous health indicators from the state's CalEnviroScreen model (version 3.0), and various other socioeconomic indicators. In developing San Joaquin Valley community recommendations for additional clean air resources and public engagement under AB 617, the District conducted a public engagement process to seek input from Valley residents, businesses, agencies, and other stakeholders through public workshops and meetings throughout the Valley.

Based on this extensive public engagement effort, significant interest and support for the Arvin/Lamont community, and the District's comprehensive identification and prioritization analysis: the Arvin/Lamont Community was recommended by the District Governing Board as a third-year AB 617 community. The City of Arvin and nearby Lamont are part of a small, rural community in Southeast Kern County, and have long been recognized as one of the most air quality impacted areas of the Valley. A number of heavily trafficked highways pass nearby, including Hwy 184 and Hwy 223, contributing to overall emissions in the community. The community is also surrounded by agricultural operations, industrial sources, and emissions traveling downwind from the City of Bakersfield to the northwest. The Arvin/Lamont community was ultimately selected by the CARB Governing Board in February 2021 for the development of a community air monitoring plan and an emissions reduction program designed to reduce pollution impacts in the selected community.

The District community recommendation for CARB under the third-year of AB 617 implementation can be found here:

https://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2020/September/final/08.pdf

COMMUNITY STEERING COMMITTEE OBJECTIVES

In accordance with the community-driven nature of AB 617 directives, staff worked to convene a CSC under a set of guiding principles set forth by the District's Governing Board. The Arvin/Lamont CSC is comprised of residents, businesses, community based organizations, environmental justice advocates, and public agencies, working together to craft and develop a community air monitoring plan and this Community Emissions Reduction Program (CERP). To ensure successful implementation of AB 617, residents, businesses, non-profits organizations, state and local agencies, and other stakeholders from all sectors within the selected community were involved in the development of CERP.

COMMUNITY AIR MONITORING PLAN

The District worked closely with the Arvin/Lamont CSC to draft a community air monitoring plan. The community-specific air monitoring network, as developed in consultation with the CSC, will provide an expanded monitoring capacity designed to

provide scalable, portable, and rapidly deployable air monitoring equipment to the community. This includes a combination of air monitoring platforms equipped with highly specialized analyzers capable of monitoring a full range of criteria and toxic pollutants. Various monitoring platforms include larger air monitoring trailers, mobile air monitoring vans, and compact air monitoring sensors. Monitoring data from these sensors will be made available to members of the public in real-time on the Arvin/Lamont AB 617 webpage.

COMMUNITY EMISSIONS REDUCTION PROGRAM

The Arvin/Lamont Community Steering Committee has developed this Community Emissions Reduction Program (CERP), in partnership with CARB, residents, affected sources, and local government bodies in the affected community. Steering Committee input and other comments received from the public in the community have provided instrumental information, critical to implementing community-specific measures and addressing community concerns. Strong collaboration between community members, the District, CARB, and other local agencies has resulted in the development of an ambitious plan for reducing localized pollution and associated health impacts in the Arvin/Lamont AB 617 Community.

This CERP provides a description of the Arvin/Lamont AB 617 Community, including geographical boundaries and socioeconomic factors impacting community residents. A technical analysis describes the sources of pollution affecting the community, as well as the location of sensitive receptors within the community. Sources of pollution that are of particular concern to community members are highlighted, and possible strategies for reducing pollution impacts from these sources are evaluated. The strategies that were ultimately selected by the CSC for implementation in the community include incentive funding measures, public engagement strategies, enforcement strategies, regulatory strategies, and strategies that will be completed in partnership with other agencies and local organizations. Finally, an implementation schedule and metrics for tracking emission reductions in both annual and five-year milestone reports are discussed in detail.

1.2. HEALTH BASED AIR QUALITY OBJECTIVES

CERPs implemented under AB 617 are designed to reduce emissions of pollutants that have been shown to have adverse impacts on public health, including fine particulate matter and toxic air contaminants. As specified in CARB's Community Air Protection Program Blueprint, Appendix C: Criteria for Community Emissions Reduction Programs (https://ww2.arb.ca.gov/sites/default/files/2018-10/final_community_air_protection_blueprint_october_2018_appendix_c.pdf), this plan will focus on reducing individual criteria air pollutant and toxic air contaminant emissions to address the impacts of community exposure to multiple pollutants. While each community faces distinct health-based challenges, CARB guidance states that broad health-based air quality objectives provide a consistent foundation for determining the appropriate levels of emissions reductions for CERPs statewide.

The U.S. Environmental Protection Agency and the State of California have established ambient air quality standards, which set health-protective levels for the following criteria pollutants: ozone, particulate matter with a diameter of 10 microns or smaller (PM10), particulate matter with a diameter of 2.5 microns or smaller (PM2.5), carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. California also has standards for sulfates, vinyl chloride, and hydrogen sulfide. Due to the region's topography and meteorology, the Valley is classified as Serious nonattainment for the federal PM2.5 standards, and Extreme nonattainment for federal ozone standards.

Particulate Matter: Particulate matter is a mixture of solid particles and liquid droplets in the air. PM can be emitted directly into the atmosphere (primary PM), or can form as secondary particulates in the atmosphere through the photochemical reactions of precursors (when precursors are energized by sunlight). Thus, PM is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. PM10 is particulate matter that is 10 microns or less in diameter, and the PM2.5 subset includes smaller particles that are 2.5 microns or less in diameter.

Any particles 10 microns or less are considered respirable, meaning they can be inhaled into the body through the mouth or nose. PM10 can generally pass through the nose and throat and enter the lungs. PM2.5, which is the portion of PM10 that is less than 2.5 microns in size, when inhaled can move deep into the gas exchange tissues of the lungs, where it can be absorbed into the bloodstream and carried to other parts of the body. The potential health impacts of particle pollution are linked to the size of the particles, with the smaller particles having larger impacts. Numerous studies link PM2.5 to a variety of health problems, including aggravated asthma, increased respiratory symptoms (irritation of the airways, coughing, difficulty breathing), decreased lung function in children, development of chronic bronchitis, irregular heartbeat, non-fatal heart attacks, increased respiratory and cardiovascular hospitalizations, lung cancer, and premature death. Children, older adults, and individuals with heart or lung diseases are the most likely to be affected by PM2.5.

Many studies have quantified and documented the health benefits of attaining the U.S. Environmental Protection Agency (EPA) air quality standards for PM. The Valley Air Basin is in attainment of the federal standards for PM10, but is currently classified as Serious nonattainment for the federal PM2.5 standards. The District, in partnership with CARB, developed the *2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards*, which was approved by EPA on June 30, 2020 and details strategies to move the region towards attainment of the federal PM2.5 standards. More information is available at: <http://valleyair.org/pmplans>. The plan is also discussed in further detail in Chapter 3.

Ozone: Ozone is a regional air pollutant that is formed through complex chemical reactions in the atmosphere. In contrast, PM2.5 concentrations are the result of both local and regional emissions, and reducing localized emissions of PM2.5 can reduce disparities in exposure experienced in communities with high cumulative exposure burdens. CARB Office of Community Air Protection guidance states that, because ozone formation is driven by regional rather than localized source contributions, ozone

should be addressed in regional air quality improvement efforts through the State Implementation Plan. Therefore, ozone and related precursors have not been addressed as a part of this CERP development. The District's current plan for attainment of health-based ozone standards throughout the San Joaquin Valley Air Basin can be found here: http://valleyair.org/Air_Quality_Plans/Ozone_Plans.htm

Toxic air contaminants: Toxic air contaminants (TACs) also contribute to a community's cumulative exposure burden. Exposure to TACs can increase the risk of acute and chronic health impacts as well as cancer. Diesel particulate matter is a large concern in areas with high exposure to diesel engine emissions, such as the community of Arvin/Lamont AB 617 Community. Other toxic air contaminants can contribute to localized health risks, including metals; air toxics related to fossil fuel production, such as benzene and toluene; and compounds associated with combustion, including polycyclic aromatic hydrocarbons and dioxins. The California Office of Environmental Health Hazard Assessment (OEHHA) establishes threshold concentrations for toxic air contaminants at which exposure is not expected to trigger non-cancer health effects. For carcinogens, OEHHA guidance states that there are no safe exposure thresholds. Reducing emissions in the community will be based on identifying technologies and practices that offer the maximum level of toxic air contaminant emissions reductions achievable to address both types of health effects

With the support of community members, this CERP will build upon regional efforts to improve air quality throughout the Valley Air Basin. The Arvin/Lamont AB 617 Community CERP focuses on reducing emissions of and exposure to PM_{2.5} and toxic air contaminants from localized sources that contribute to cumulative exposure burdens within the community. Pollution reduction strategies, targets, goals, and metrics included in this CERP have been developed in accordance with these health-based air quality objectives and are presented in more detail in Chapter 4 of this document.

2. COMMUNITY PARTNERSHIPS AND PUBLIC ENGAGEMENT

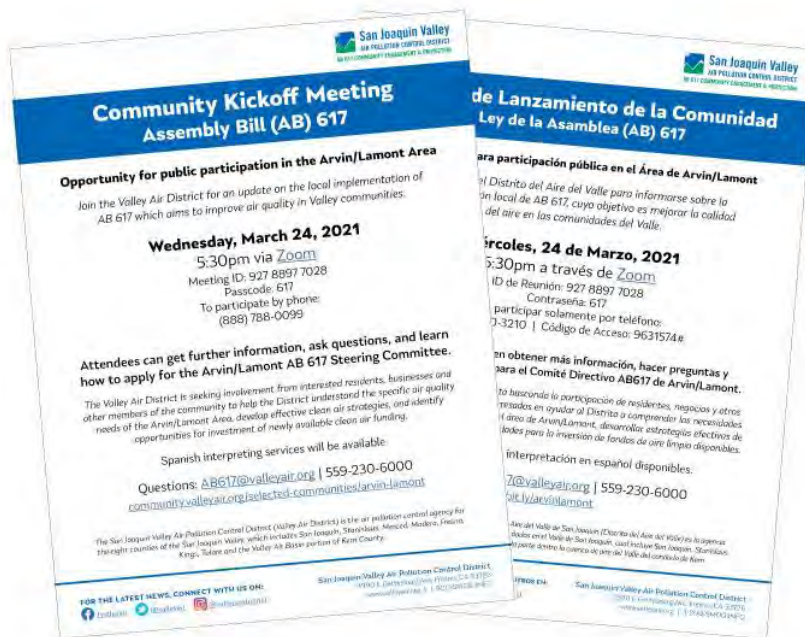
Meaningful community engagement, significant outreach and a robust public process have guided the development of this Community Emissions Reduction Program (CERP). Key features of these efforts undertaken by the Community Steering Committee and the District include:

- District hosted kick-off meeting to solicit feedback on conducting initial public outreach and establishing a Community Steering Committee
- Implemented a “community co-lead” model where community members were nominated and selected by the CSC to help guide the committee and assist with agenda setting, meeting logistics and communication to the resident members
- Held monthly facilitated, bilingual (English and Spanish) virtual meetings (due to ongoing COVID-19 pandemic)
- Live-streamed and recorded all CSC meetings:
(<https://community.valleyair.org/selected-communities/arvin-lamont/steering-committee-meetings>)
- Surveyed needs and resources of the CSC members and worked to provide training and computer technology to assist members in accessing virtual meetings
- Provided bilingual materials via email, mail and the AB 617 community webpage (<https://community.valleyair.org/selected-communities/arvin-lamont/>)
- Implemented a Resident member stipend program to encourage participation in regular meetings
- Used interactive online survey tools (in both English and Spanish) such as Survey Monkey and Social Pinpoint to encourage active participation and to develop visual aids to share information to the CSC; and
- Shared presentations and information from: the District, CSC members, CARB staff, OEHHA, the California Department of Pesticide Regulation, Central California Environmental Justice Network, the City of Arvin, the County of Kern and the Kern Council of Governments

2.1. COMMUNITY KICKOFF MEETING

In February 2021, District staff conducted multilingual outreach, worked collaboratively with environmental justice organizations, distributed bilingual flyers (Figure 2-1) to local schools, media and agencies and invested approximately \$2,000 in social media advertisements targeted at the Arvin/Lamont zip codes to encourage attendance at the official March community kickoff meeting. Additionally, a pre-meeting was held with many local advocacy groups, interested residents, District and CARB staff and others to discuss the approach for the March kickoff meeting and plan for the wide recruitment of CSC resident members. CARB shared the background on the selection of Arvin/Lamont as a community under AB 617 as well as the criteria that would be used by the committee to develop a community air monitoring plan and a community emissions reduction program.

Figure 2-1 Bilingual Community Flyers Distributed



The Community Kickoff Meeting was held virtually, due to the Covid-19 pandemic, through Zoom on Wednesday, March 24, 2021 (Figure 2-2). Approximately 75 people attended the meeting, which was presented in English and Spanish. In addition to information about AB 617, attendees learned about monitoring technology and District incentive programs. Community members were encouraged to apply to be on the Community Steering Committee at the Kickoff meeting, with additional time provided for individuals to apply via email or mail.

In addition, the District distributed bilingual flyers (Figure 2-1) to local media, schools, agencies, and non-profit organizations; and invested in social media advertisements

targeted at the Arvin/Lamont Community zip codes to encourage kickoff meeting participation.

Figure 2-2 Community Kickoff Meeting



2.2. COMMUNITY STEERING COMMITTEE

COMMUNITY STEERING COMMITTEE MAKE-UP

The District received applications from over 80 individuals interested in participating in the Community Steering Committee (CSC). Before a final decision could be made regarding the makeup of CSC membership, the group first had to finalize the boundaries, which would guide who would be eligible for the CSC. Therefore, initial meetings of these interested AB 617 volunteers consisted of formal boundary discussions. The group collectively requested the boundary be expanded to include a larger footprint around Arvin and Lamont.

The final Boundary can be found at

<https://sjvapcd.maps.arcgis.com/apps/webappviewer/index.html?id=def12eb079854df4b78c9451c6375f1a>

In response to boundary expansion, an additional application period was opened and community members within the expanded area were invited to apply. The final committee consists of 52 community residents; 12 individuals representing environmental justice organizations working in the community, health care organizations, educational entities, or businesses within the community; and five non-voting government officials.

In addition to the regular CSC members, several individuals and entities have alternate

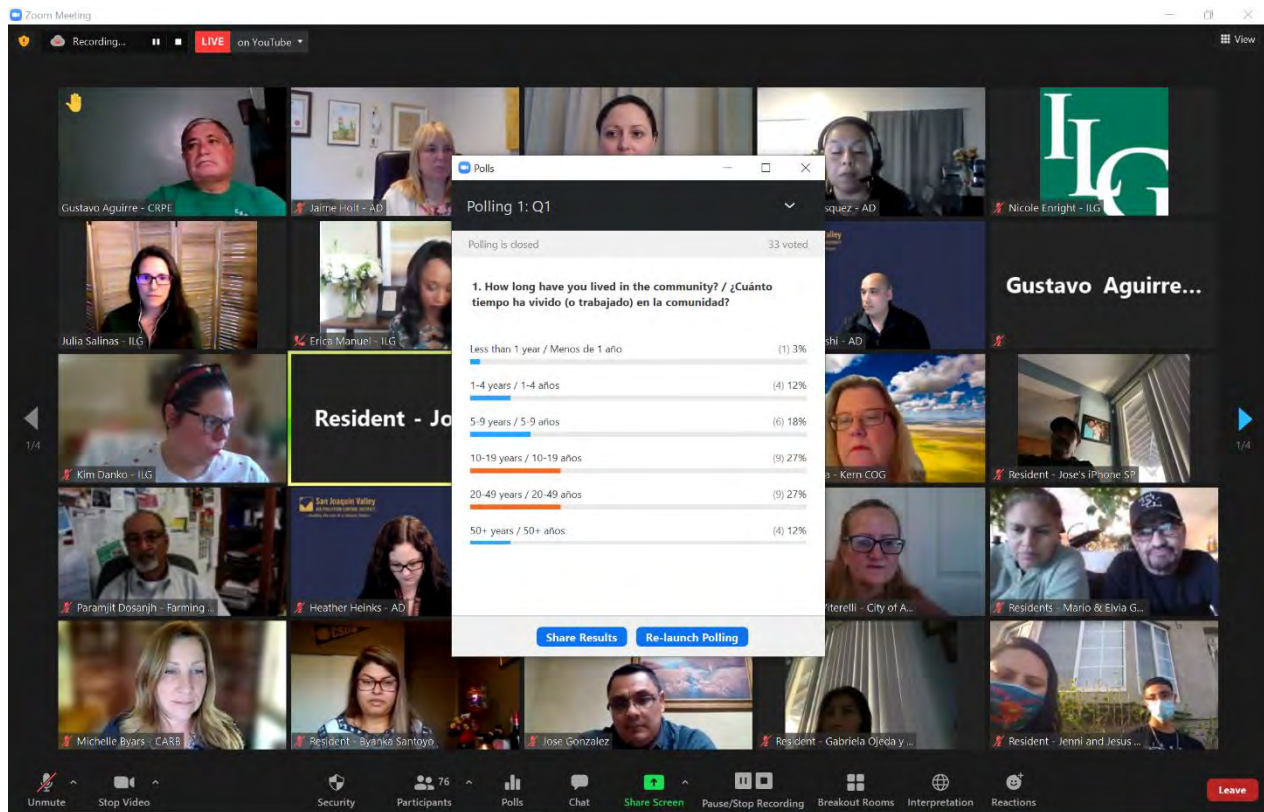
members, should they be unable to attend. A full roster of membership is available at <https://community.valleyair.org/selected-communities/arvin-lamont/steering-committee-documents>

The Arvin/Lamont Community Steering Committee met at least once a month, usually on the fourth Wednesday of the month via Zoom throughout the CERP development process. Community Steering Committee meetings were initially facilitated by the Institute for Local Government (ILG), and following the close of their contract in September 2021, Harder & Co. was selected by community members throughout the Valley CSCs to facilitate meetings from October 2021 onward.

To ensure full engagement by all CSC members during CERP development, the District assessed language and technology needs by surveying CSC members and determined there was a need to provide Spanish interpretation at each of the meetings. Additionally, the committee identified and selected community resident “co-leads” to help coordinate agendas, communicate to members and guide the discussion. The commitment demonstrated by the District and CSC members to ensure ongoing full and active participation in meetings included:

- Monthly agenda-setting meetings with District, community co-hosts, interested CSC members, CARB staff, and third-party facilitators to collectively set expectations and plan for upcoming CSC meetings
- Real-time interpretation services in all necessary languages
- An Information Session on how to join meetings on Zoom
- Expert presentations from partner agencies such as CARB, OEHHA, County of Kern, District staff, and CSC members
- Comprehensive and dedicated Arvin/Lamont community webpage with tools to view the community boundary, committee charter, meeting agendas, sources of community concern, emissions inventories, and other resources
- Neutral meeting facilitation to ensure meetings are inclusive and neutral by bringing out different points of view and preventing individuals from monopolizing discussions
 - Monthly evening meetings via Zoom, with technical assistance provided to residents and stakeholders upon request
 - Meeting materials posted ahead of meeting
 - Extra meetings to discuss topics or concerns Community Steering Committee members have
 - Provided free laptops and internet connectivity to resident CSC members without these tools to ensure all CSC members have equal opportunities to fully participate

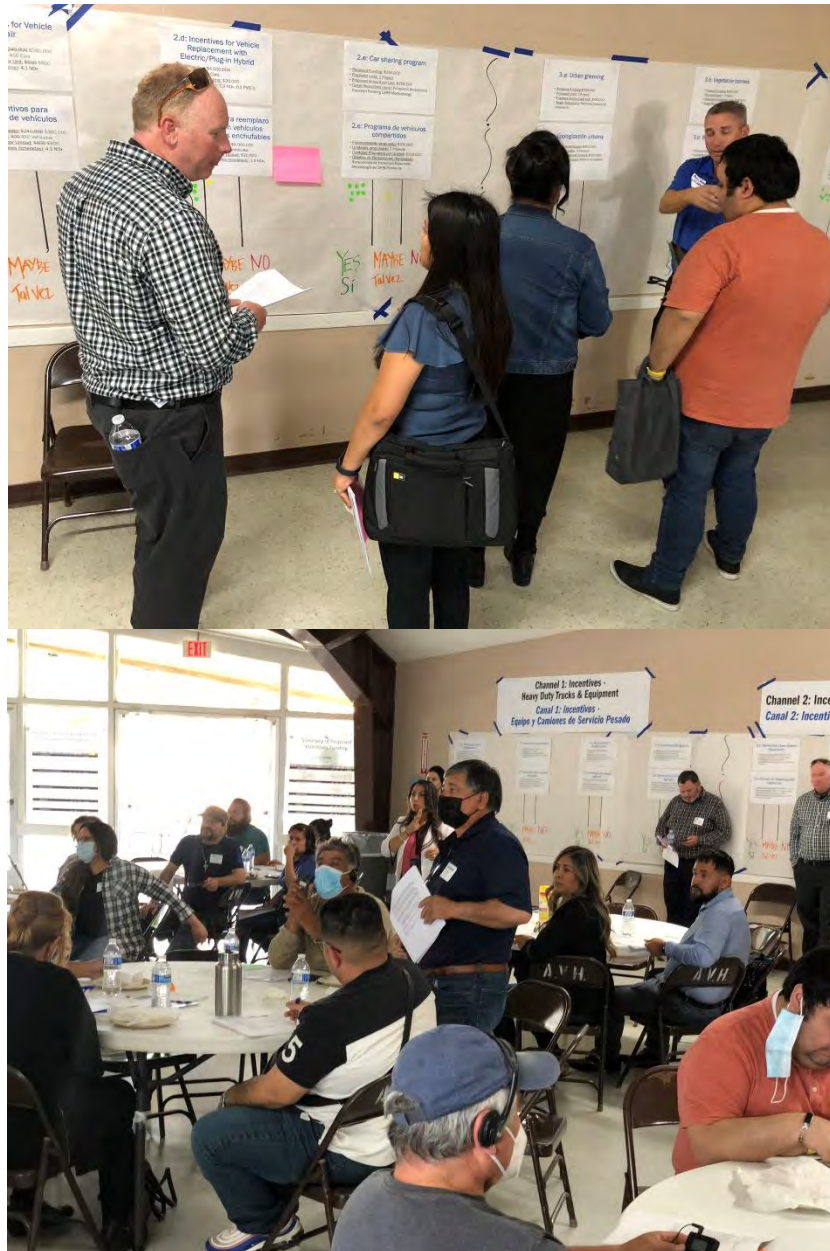
In addition, the District has taken steps over the past several months to better serve CSC members and encourage their active engagement in the meetings and CERP development process. Ensuring effective steering committees requires substantial investment in the form of committee member time, District staff and other resources to schedule, organize, and facilitate frequent after-hours public meetings.

Figure 2-3 Arvin/Lamont AB 617 Community Steering Committee meeting

Visit <https://community.valleyair.org/selected-communities/arvin-lamont/steering-committee-meetings> for full documentation of meeting dates, agendas, materials and summaries.

In-Person Meeting

The Arvin/Lamont CSC held the state's first in-person regular CSC meeting since March 2020. Following local and statewide regulations for COVID-safe operation, over 30 Arvin/Lamont Community Steering Committee members, mostly residents, attended a dynamic CERP development meeting in April 2022 in the Arvin community. To help make the most out of the community members' time and efforts, the District provided food, activities for youth attendees, simultaneous interpretation, and bilingual outreach materials.



COMMUNITY PARTICIPATION AND RESIDENT STIPEND PROGRAM

The Arvin/Lamont Community Steering Committee met regularly, requiring ongoing participation and a significant time commitment from community residents, business owners, and other stakeholders. Providing stipends to help cover some time and expenses associated with attending meetings was established as an important way to support this critical participation and encourage sustained and meaningful community engagement throughout these processes.

Under the stipend program developed by District staff, in consultation with CSC stakeholders across all San Joaquin Valley AB 617 communities, residents who participate as community steering committee members, who do not receive compensation for their attendance at such meetings, may request a stipend to offset the cost of participating in each regular Community Steering Committee meeting. Eligible residents may receive a \$75 stipend per Community Steering Committee meeting when their attendance is verified on the meeting attendance list or chat transcript for at least 75% of the scheduled meeting (equivalent to missing up to 30 minutes of a scheduled two hour meeting). Residents will receive stipends for attending up to fifteen (15) Community Steering Committee meetings in a calendar year, for a total cost of up to \$1,125 per year. The stipends for resident steering committee members are subject to the availability of state AB 617 funding and approved allocation in the District's Budget on an annual basis.

Figure 2-4 Resident Stipend Enrollment Form



San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT



AB 617 Community Air Protection Program Resident Stipend Enrollment Form

Member Info

First and Last Name

Mailing Address City State Zip Code

(Please ensure your mailing address is correct as your stipend check will be sent to this address)

E-mail Address Preferred Phone # Is this a cell phone? ☐ Yes ☐ No

Preferred Contact Method (check one or two): ☐ Phone ☐ Text ☐ Email ☐ Mail
(Note: stipend payment will be via check sent to your mailing address listed above)

Are you interested in enrolling in direct deposit? ☐ Yes ☐ No
(If yes, please complete the Direct Deposit Authorization Form)

Verify

By signing below, I certify that the following information is true, accurate, and complete to the best of my knowledge:

- I am a resident of a AB 617 selected community and serve as a Resident member of the Community Steering Committee
- I understand that I must be present for 75% of any regularly scheduled Community Steering Committee meeting (equivalent to participating in at least 1 hour and 30 minutes of a scheduled 2 hour meeting)
- I have read and agree with the information contained in the Resident Stipend Policy
- I am not an employee of the Valley Air District or Harder+Co.
- I give my consent to the Valley Air District to use the information on this Enrollment Form for the purpose of contacting me regarding matters related to the AB 617 Community Steering Committee and determining my stipend eligibility

Signature

Date

Submit

Submit application to Harder+Co. via e-mail at inash@harderco.com.

2.3. COMMUNITY STEERING COMMITTEE CHARTER

The purpose of the Arvin/Lamont CSC is to support active community involvement and collaboration in the development of AB 617 activities and processes by providing a forum for identifying air pollution issues in the community and potential solutions.

The CSC will continue to advise and provide input and recommendations to District staff regarding the development and implementation of the CAMP and CERP to ensure that the plan and program reflect and address the community's highest priority air pollution emissions-related concerns.

A Community Steering Committee Charter was developed in consultation with the Arvin/Lamont CSC members and a draft was presented to the members at the second

meeting in May 2021. Charter language was discussed over several meetings, and the CSC reached consensus on the final Charter language at the August 5, 2021 meeting, and the CSC voted to approve the document the following meeting.

The final Charter can be found in Appendix B, and at

https://community.valleyair.org/media/3589/arvinlamont-charter-final_7292021.pdf

2.4. ARVIN/LAMONT COMMUNITY WEBPAGE

A community webpage has been created for the Arvin/Lamont AB 617 Community:

<https://community.valleyair.org/selected-communities/arvin-lamont/>

The webpage is regularly updated for community members and includes information about upcoming meetings, meeting materials (flyers, agendas, presentations, handouts, audio and video links, chat transcripts, meeting action items), interactive maps, CSC roster, committee charter, membership processes, air monitoring information and CERP documents. A screenshot of the community webpage is shown in Figure 2-8.

Figure 2-5 Arvin/Lamont AB 617 Community Webpage

Arvin / Lamont

Arvin / Lamont

Arvin/Lamont Steering Committee meetings and information
SIGN UP TO GET EMAIL NOTIFICATIONS

Press Release
ARVIN/LAMONT SELECTED AS NEXT VALLEY AB 617 COMMUNITY

Follow Up on CSC Meeting Action Items
ARVIN/LAMONT RUNNING ACTION ITEMS

Community Profile

- Steering Committee Meetings
- Other Meetings
- Steering Committee Documents
- Communication With Members
- CERP Development & Implementation
- Docs submitted by Committee

Selected community profile

The City of Arvin and nearby Lamont are part of a small, rural community in Southeast Kern County, and have long been recognized as one of the most air quality impacted areas of the Valley. A number of heavily trafficked highways pass nearby, including Hwy 184 and Hwy 223, contributing to overall emissions in the community. The community is also surrounded by agricultural operations, industrial sources, and emissions traveling downwind from the City of Bakersfield to the northwest.

The community of Arvin/Lamont is approximately 17 square miles and has an estimated population of 37,000. The Arvin/Lamont community is impacted across a number of health and pollution indicators. Using the State CalEnviroScreen tool, the census tracts located within the proposed community rank in the top 15% statewide for overall CalEnviroScreen score, weighted for PM2.5 and ozone impacts, which represents a number of health and socioeconomic factors (asthma, cardiovascular disease, low birth weight, educational attainment, housing burdened low income households, linguistic isolation, poverty, and unemployment). Additionally, the Arvin/Lamont community was selected for the Institute for Local Government's Boost Program in collaboration with the Strategic Growth Council, which has afforded them technical assistance with capacity building for air quality improvement and energy reduction. These efforts in the community allow the District and community to leverage resources to maximize benefits under AB 617.

Resources

BOUNDARY MAP

Map of Emissions Inventory by Pollutant

ENGLISH ESPAÑOL

Map of Stationary Sources within Community

ENGLISH ESPAÑOL

Community Emissions Summary Table

ENGLISH ESPAÑOL

Emissions summaries for District permitted facilities within the Arvin/Lamont community boundary:

- **NOx**
ENGLISH ESPAÑOL
- **VOC**
ENGLISH ESPAÑOL
- **PM2.5**
ENGLISH ESPAÑOL
- **Air Toxics**
ENGLISH ESPAÑOL

For assistance or if you have any questions, please feel free to [contact us](#)

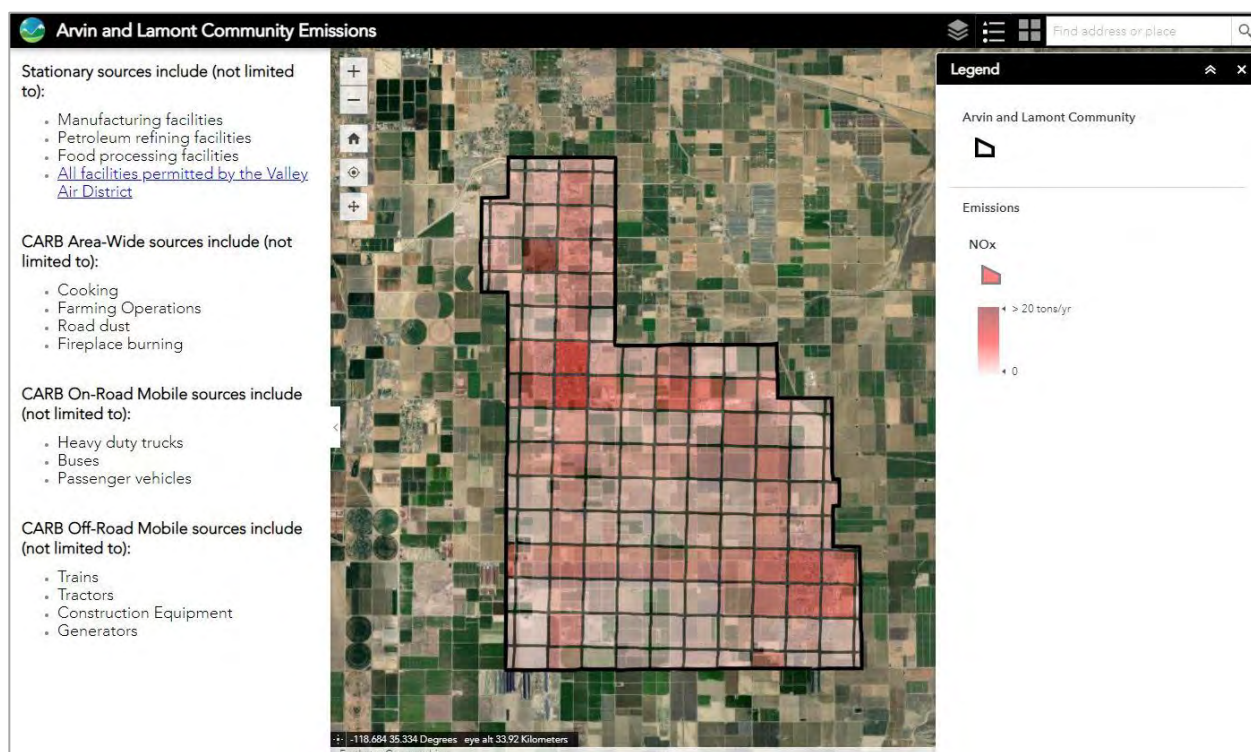
CALIFORNIA CLIMATE INVESTMENTS
Cap and Trade Dollars at Work

AB 617 is part of California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy and improving public health and the environment – particularly in disadvantaged communities.

In addition to being a portal for access to meeting materials and documents, the webpage also includes interactive maps that present data community (<https://sjvapcd.maps.arcgis.com/apps/webappviewer3d/index.html?id=918e82e790e04e2aa64044243b95836b>).

Figure 2-9 is an example of an interactive map that was created for the Arvin/Lamont AB 617 Community. These interactive maps provide data on land use, locations of facilities, schools, hospitals, and the air quality concerns identified by the Arvin/Lamont AB 617 Community Steering Committee and members of the public. This information was provided to help inform and to develop air quality priorities for the CERP.

Figure 2-6 Interactive Map Created for Arvin/Lamont AB 617 Community Steering Committee



2.5. COMMUNITY PARTNERS

After the Arvin/Lamont AB 617 CSC identified priorities for the community, partner agencies and organizations were invited to the meetings to provide updates, input, and presentations on current and future efforts to the in line with the goals of AB 617. CARB staff attended meetings regularly and provided information and updates to the committee.

The Kern County Department of Agriculture, City of Arvin and Kern County staff also attended regularly and provided an update on planning efforts in the community. The efforts of the Department of Pesticide Regulation, Office of Environmental Health Hazard Assessment, Kern County Ag Commissioner and others were all presented to the CSC

to help provide background information to the participants.

ADDITIONAL COMMUNITY ENGAGEMENT

The CSC and District staff have worked to engage and educate the public with regard to AB 617 and the efforts being made in the Arvin/Lamont AB 617 Community. Meetings between community members, environmental justice organizations, industry, agency representatives, and other stakeholders have occurred to provide assistance and/or prompt responses to concerns raised regarding the AB 617 process. In addition, staff often discussed AB 617 opportunities at media interviews and during outreach events. A full list of outreach efforts is available in Appendix A.

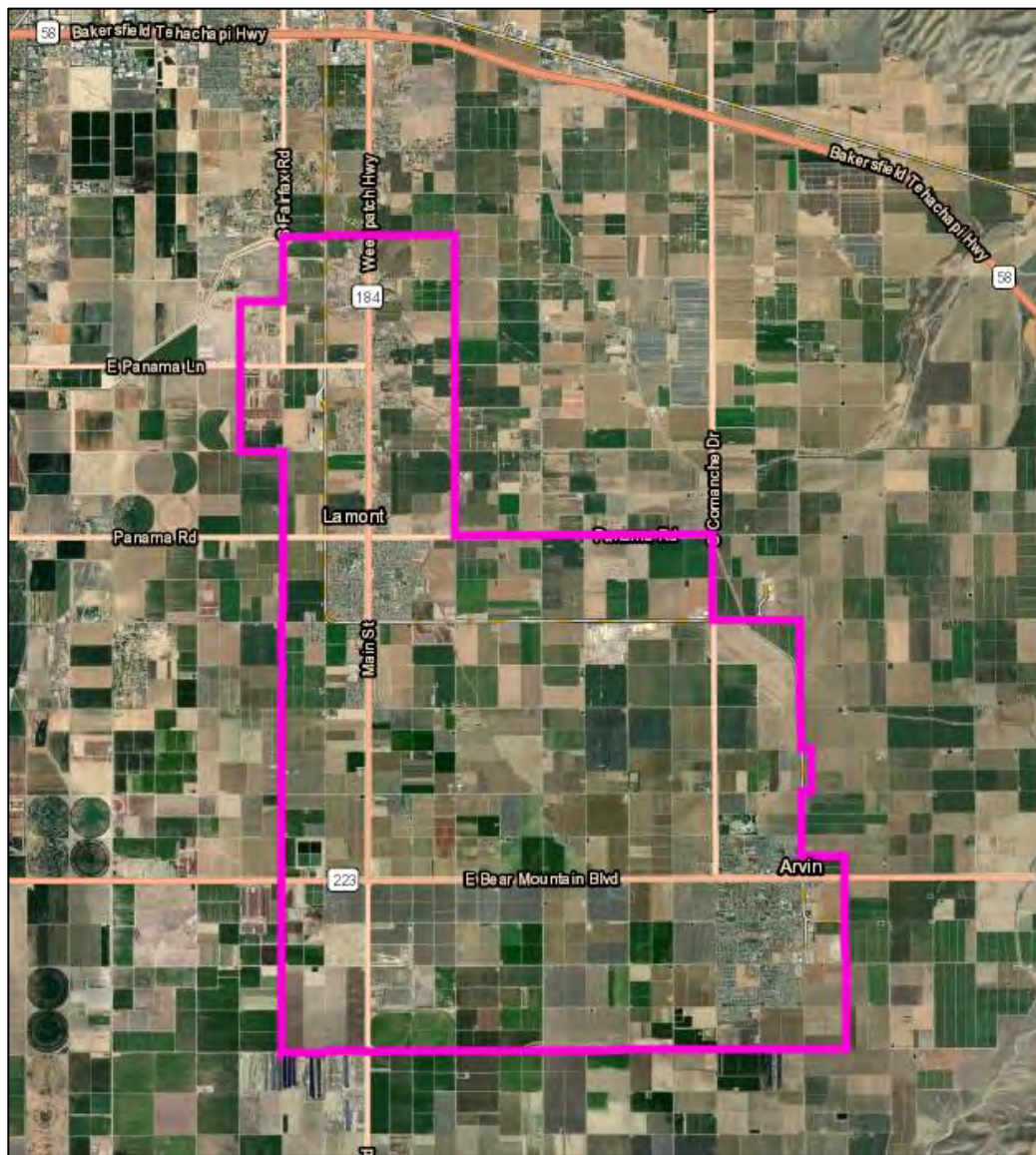
The Arvin/Lamont AB 617 CSC will continue to work to implement the CERP actions after its adoption by the District Governing Board and the CARB Board, and to provide periodic community updates on implementation progress. Community engagement is essential to the success of the CERP as well as the AB 617 program as a whole, and all parties are committed to improve on existing outreach efforts in the coming months and years.

3. UNDERSTANDING THE COMMUNITY

3.1. COMMUNITY PROFILE

The City of Arvin and nearby unincorporated Kern County communities of Lamont, Weedpatch and Fuller Acres, are part of a small, rural community in Southeast Kern County, and have long been recognized as one of the most air quality impacted areas of the Valley. A number of heavily trafficked highways pass nearby, including Hwy 184 and Hwy 223, contributing to overall emissions in the community. The community is also surrounded by agricultural operations, industrial sources, and emissions traveling downwind from the City of Bakersfield to the northwest.

Figure 3-1 Arvin/Lamont AB 617 Community



ARVIN/LAMONT AIR QUALITY CHALLENGES

The Arvin/Lamont AB 617 community boundary area is approximately 43 square miles and has an estimated population of 41,000. The Arvin/Lamont community is impacted across a number of health and pollution indicators. Using the State CalEnviroScreen tool (version 3.0), the census tracts located within the proposed community rank in the top 15% statewide for overall CalEnviroScreen score, weighted for PM_{2.5} and ozone impacts, which represents a number of health and socioeconomic factors (asthma, cardiovascular disease, low birth weight, educational attainment, housing burdened low income households, linguistic isolation, poverty, and unemployment). The majority of emissions affecting the Arvin/Lamont AB 617 community come from heavy-duty truck and off road equipment emissions from the highways and main regional roads that run through the community.

While the regulatory air quality monitors around Arvin/Lamont show that Valley portion of Southeastern Kern County continues to have some of the toughest air quality challenges in the region, decades-long air quality trends demonstrate continued reductions in air pollution because of pollution reductions efforts across the Valley. AB 617 brings opportunity to focus resources that will help continue to work in the community to find innovative emissions reduction solutions to improve air quality and public health in the Arvin/Lamont community.

In addition to the emissions originating from mobile sources in the area, this community also includes industrial development and area-wide sources of pollution such as gas stations, commercial cooking, residential wood burning, and consumer products that also contribute significantly to the community's emissions levels.

EMISSIONS IN COMMUNITY

Based on emissions inventory and current air monitoring data in this community, pollutants of concern include particulate matter less than 2.5 micrometers in diameter (PM_{2.5}), Black Carbon (BC), Oxides of Nitrogen (NO_x), Carbon Monoxide (CO), Ozone (O₃), Volatile Organic Compounds (VOCs), and pesticides.

Based on District air quality analysis modeling, the Arvin/Lamont AB 617 Community was found to have exceeded the 24-hour average PM_{2.5} concentration levels of 12, 35, 55, and 65 µg/m³ a total of 104, 17, 9, and 6 days, annually, on average during the 2018-2020 period, respectively. In addition, this community was found to have exceeded the 8-hour average ozone concentration prioritization factor levels of 70, 75, and 84 ppb a total of 61, 32, and 10 days, annually, on average during the 2018-2020 period, respectively. Details about the nature and formation of local air pollution and its adverse health impacts on the community of Arvin/Lamont AB 617 Community is summarized in Appendix G.

3.2. TECHNICAL ASSESSMENT TO UNDERSTAND COMMUNITY POLLUTION IMPACTS

Conducting a technical assessment is a necessary step in Community Emissions Reduction Program development. The technical assessment relies on results from a variety of analyses to characterize emissions in the community and inform community emissions reduction program development and implementation. This assessment will provide the baseline from which emissions reductions can be measured.

The source attribution technical approach established by CARB provides a methodology for assessing, identifying, and estimating the relative contribution of sources or categories of sources, including but not limited to mobile, stationary, and area-wide sources, to elevated exposure to air pollution in impacted communities. The District's source attribution analysis is based on the following:

- Assesses the share of mobile, area-wide, and stationary source emissions generated in the community,
- Is based on best available data in order to characterize the contribution of emissions sources in the community,
- Follows one of CARB's recommended source attribution approaches.

Based on the above, the District has implemented CARB's Community Emissions Inventory Approach. The following section discusses the community emissions inventory approach and summarizes emission sources in the community. A detailed community-level inventory and source apportionment are included in Appendix C.

COMMUNITY EMISSIONS INVENTORY APPROACH

A community level emissions inventory estimates air pollutant emissions from mobile sources (e.g., cars, heavy-duty trucks, locomotives), area-wide sources (e.g., fireplaces, outdoor food cooking, fugitive dust), and stationary sources (e.g., gas stations, auto body shops, manufacturing facilities) within the community.

The community level inventory consists of the mobile and area-wide sources spatially allocated in the community and stationary sources. A community emissions inventory is the compilation of criteria pollutant and air toxics emissions data from air pollution sources that are within the community. The community emissions inventory includes emissions of volatile organic compounds / reactive organic gases (VOC/ROG), oxides of nitrogen (NOx), particulate matter of 2.5 microns (PM_{2.5}), and toxic air contaminants (e.g. diesel PM).

COMMUNITY EMISSIONS INVENTORY OVERVIEW

Emissions inventories are estimates of the amount and type of pollutants emitted into the atmosphere by mobile sources, stationary sources, and area-wide sources. Additionally, emission inventories are the foundation for any emission reduction program and provide information on the existing air emissions and related air quality in the community, and support development of emission reduction strategies and future

emission targets to improve air quality in the community.

Existing traditional criteria pollutant and air toxics emission inventories (that provide combined coverage of mobile and stationary sources) are generally regional in geographic scale and may not adequately characterize emission impacts at the community-level. Developing community-scale emission inventories for understanding existing baseline emissions and tracking future emission reductions within communities selected for Community Emissions Reduction Programs (CERPs) and Community Air Monitoring Plans (CAMPs) is an important piece of AB 617. Information and data collected as part of the CAMP will be available real-time and District staff will be providing regular updates on the analysis of the data which may result in modification to existing or development of new strategies for the CERP.

AGENCY COLLABORATIONS

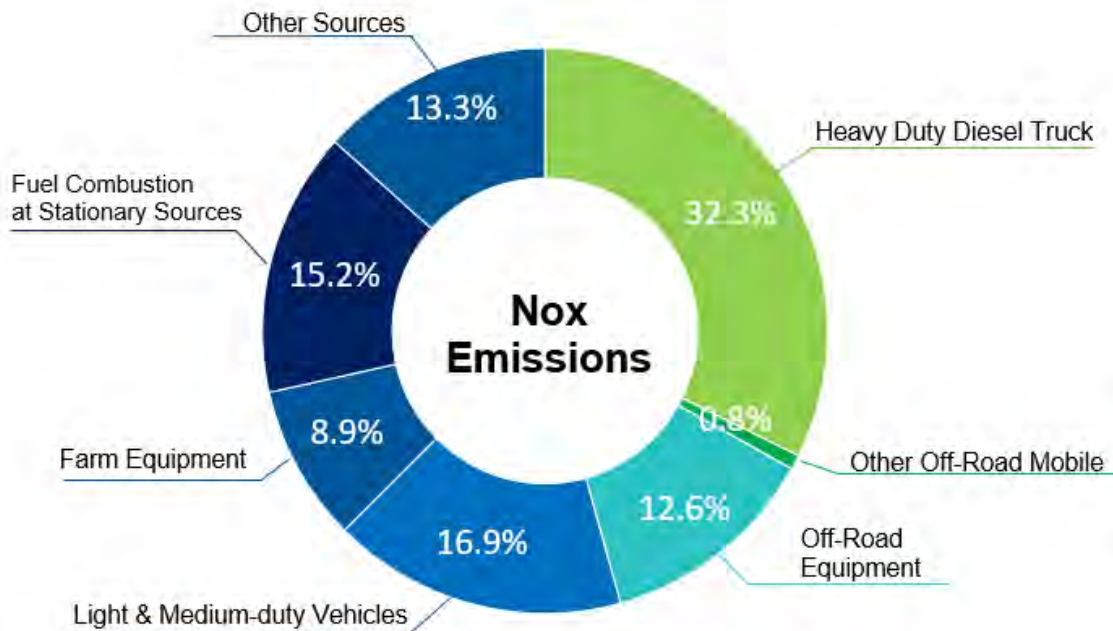
CARB and District staff worked in parallel to develop a comprehensive set of emissions inventory data for the community. The District worked with stationary source facilities in the community to develop the point source emission estimates. CARB staff developed the community-level emission inventory for mobile and area-wide sources. CARB worked with several State and local agencies such as the Department of Transportation (Caltrans), the Department of Motor Vehicles (DMV), and the California Energy Commission (CEC) to assemble activity information necessary to develop the community-level mobile and area-wide source emission estimates. CARB and District staff conducted a thorough review of the community inventory to ensure that the emission estimates reflect the most recent data for stationary sources, and that estimates for mobile and area-wide sources are based on the most recent models and methodologies.

The emissions inventory also includes future forecasted values. The forecasted community-level emissions inventory is based on the growth profiles for stationary sources, mobile, and area-wide source categories provided by CARB. Forecasted emissions include growth and control factors that reflect historical trends, current conditions, and recent economic and demographic forecasts.

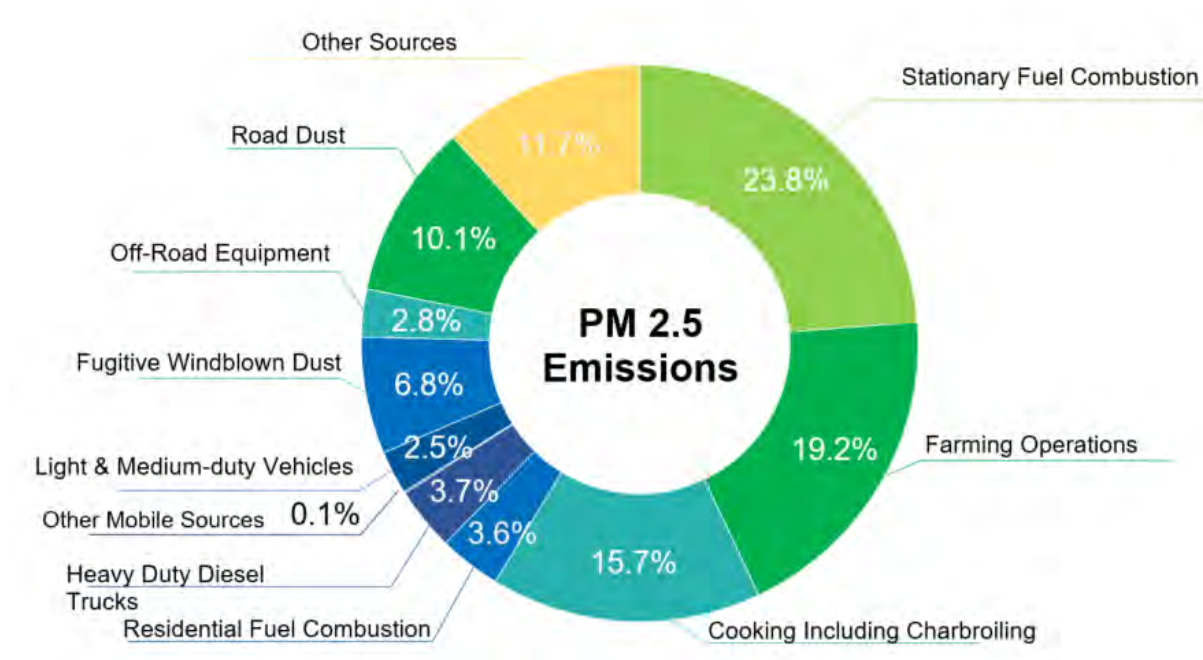
COMMUNITY EMISSION INVENTORY SUMMARIES

What types of sources contribute to air pollution in Arvin/Lamont?

The largest sources of emissions in and around the community include heavy-duty vehicles, medium-duty vehicles, and passenger cars, as well as off-road equipment, and stationary sources. Permitted stationary sources regulated by the District in the Arvin/Lamont AB 617 Community include agricultural products, automotive body repair and paint shops, concrete and construction materials manufacturing, food products; gasoline dispensing operations, government services, metal fabrication, oil and gas industry, product distribution, telecommunications, wood products and coating facilities. Farming operations, residential fuel combustion, paved road dust emissions, and commercial cooking also contribute significantly to the community's emissions inventory.

Figure 3-2 Sources of NOx Emissions in the Community

Almost three-quarters of NOx emissions in the Arvin/Lamont AB 617 Community are from mobile sources. On road mobile sources account for 49.2% of NOx emissions in Arvin/Lamont, including 32.3% of the NOx inventory from heavy-duty diesel trucks and 16.9% from light and medium-duty vehicles. Off-road mobile sources, including trains, aircraft, and off-road equipment such as yard trucks, produce 12.6% of the NOx emissions in the community. Fuel combustion at stationary sources is also a significant source of NOx emissions in the community. For more specific information, refer to [Appendix C \(Source Apportionment and Community\)](#).

Figure 3-3 Sources of Directly-Emitted PM_{2.5} Pollution in the Community

The largest sources of directly-emitted PM_{2.5} emissions in the Arvin/Lamont AB 617 Community are stationary sources, farming operation, and cooking including charbroiling. Road dust, fugitive windblown dust, and other sources are also significant sources of PM_{2.5} in the community. Other sources include trains, farm equipment, off-road equipment, unpaved roads, and managed burning and disposal.

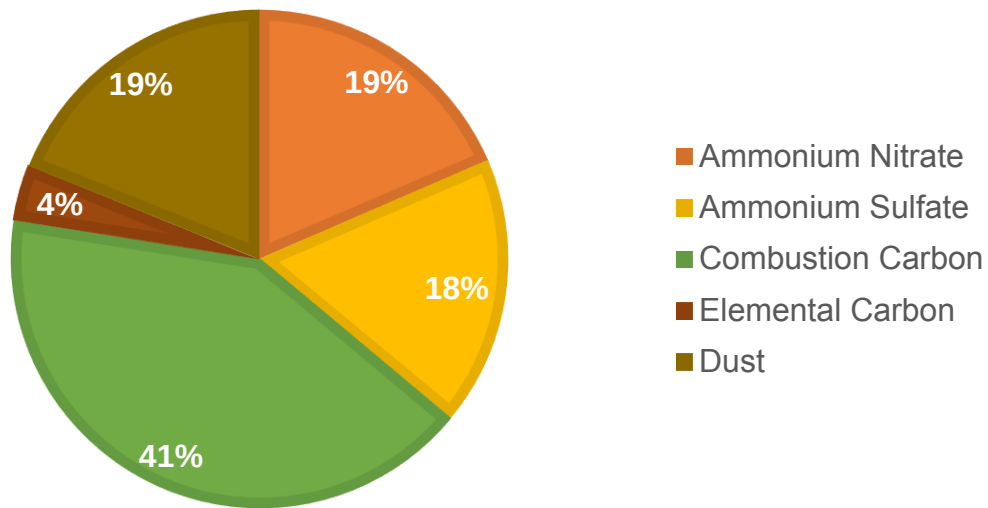
PM_{2.5} Speciation: What type of PM_{2.5} is in the ambient air?

PM_{2.5} in the Arvin/Lamont AB 617 Community is comprised of many species that contribute to the total PM_{2.5} concentration measured by air monitors, as summarized in Table 3-3 below. This complex mixture is attributable to mobile, stationary, and area-wide sources described above, as well as naturally occurring emissions. Although the list of species contributing to PM_{2.5} in the Arvin/Lamont AB 617 Community is lengthy, it can be grouped into larger representative categories. The following is a brief description of how each of these larger species categories are formed and emitted into the atmosphere. The following figures show the estimated speciation of PM_{2.5} in the Arvin/Lamont Community, based on modeling data and historical PM_{2.5} speciation monitoring and analysis conducted in the nearby City of Bakersfield.

Table 3-1 Summary of PM_{2.5} Species

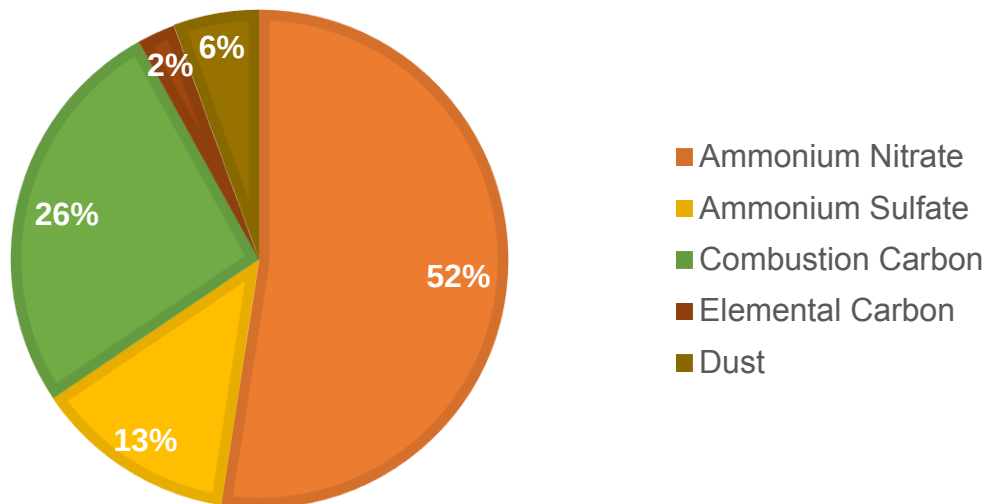
PM _{2.5} Species	Description
Organic carbon (Combustion Carbon)	Directly emitted, primarily from combustion sources (e.g. residential wood combustion, mobile sources, stationary sources). Also, smaller amounts attached to geologic material and road dusts. May also be emitted directly by natural/biogenic sources.
Elemental carbon	Also called soot or black carbon; formed during incomplete combustion of fuels (e.g. diesel engines).
Geologic material (Dust)	Road dust and soil dust that are entrained in the air from activity, such as soil disturbance or airflow from traffic.
Trace metals	Identified as components from soil emissions or found in other particulates having been emitted in connection with combustion from engine wear, brake wear, and similar processes. Can also be emitted from fireworks.
Secondary organic aerosol	Secondary particulates formed from photochemical reactions of organic carbon.
Ammonium nitrate	Reaction of ammonia and nitric acid, where the nitric acid is formed from nitrogen oxide emissions, creating nitric acid in photochemical processes or nighttime reactions with ozone.
Ammonium sulfate	Reaction of ammonia and sulfuric acid, where the sulfuric acid is formed primarily from sulfur oxide emissions in photochemical processes, with smaller amounts forming from direct emissions of sulfur.
Combined water	A water molecule attached to one of the above molecules. Combined water is not included when measuring mass of PM _{2.5} for regulatory purposes, and is therefore excluded from the following charts.

Figure 3-4 Species Contribution to Annual Average PM2.5 Concentrations in the Community



Combustion carbon, ammonium nitrate, and ammonium sulfate all are significant species of PM2.5 emissions on an average day in the Arvin/Lamont AB 617 Community.

Figure 3-5 Species Contribution to Peak Day PM2.5 Concentrations in the Community



As shown in the figure above, peak PM2.5 emission days in the community are significantly impacted by ammonium nitrate, which is created from the chemical reaction of NO_x and ammonia, largely from fuel combustion during multiday stagnation events.

However, ammonium nitrate is generally regarded as having relatively low toxicity compared to other PM2.5 species like elemental carbon.

How will the community inventory change in the future?

The tables and graphs below summarize the total Arvin/Lamont AB 617 Community emissions inventories for years 2019, 2026, and 2031. These graphs show the proportion of PM_{2.5}, NO_x, and VOC emissions that originate from stationary, area, and mobile sources of emissions. The projected inventories take into account the projected emissions from regional transportation plan projects and compliance with regulatory deadlines. The following figures show how the Arvin/Lamont AB 617 Community-level inventory is expected to change into the future in years 2026 and 2031.

Figure 3-6 2019 Arvin/Lamont AB 617 Community Emissions Inventory

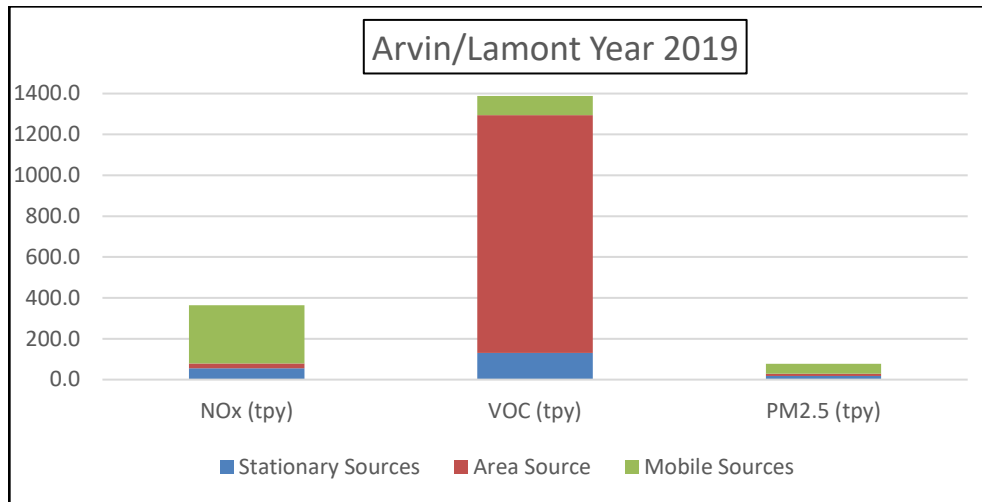
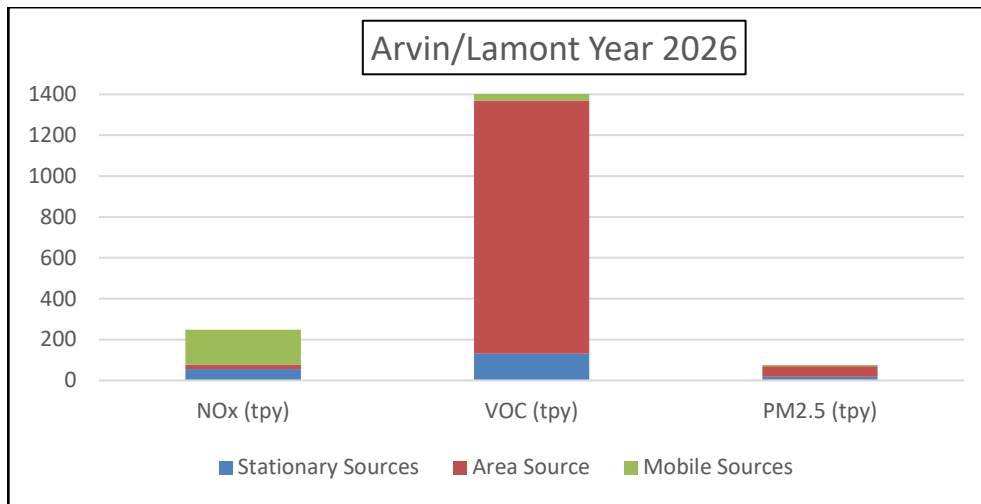


Table 3-2 2019 Arvin/Lamont AB 617 Community Emissions Inventory

Source Categories	NOx (tpy)	VOC (tpy)	PM2.5 (tpy)
Stationary Sources	55.1	130.5	18.5
Area Source	24.3	1164.0	49.75
Mobile Sources	283.9	93.6	9.69

Figure 3-7 2026 Projected Arvin/Lamont AB 617 Community Emissions Inventory**Table 3-3 2026 Projected Arvin/Lamont AB 617 Community Emissions Inventory**

Source Categories	NOx (tpy)	VOC (tpy)	PM2.5 (tpy)
Stationary Sources	43.6	127.8	18.3
Area Source	21.8	1238.6	51.3
Mobile Sources	171.0	72.9	6.4

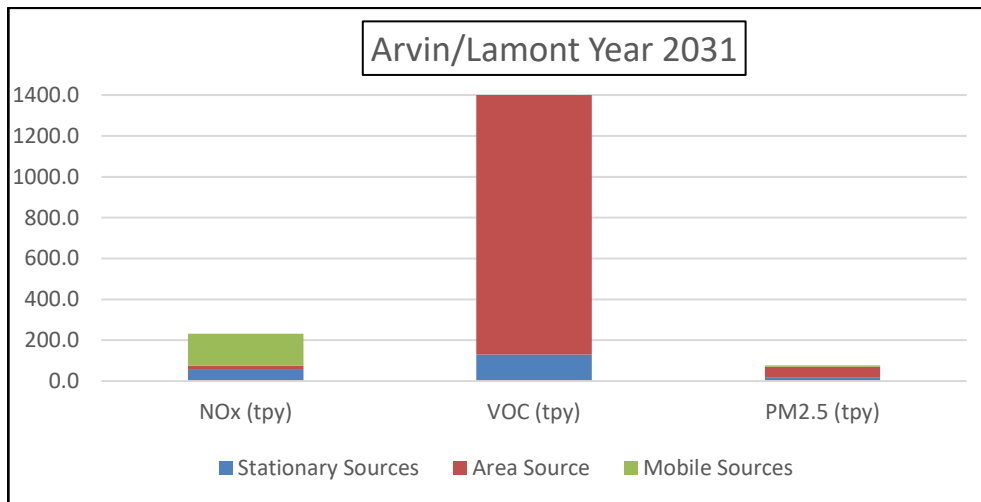
Figure 3-8 2031 Projected Arvin/Lamont AB 617 Community Emissions Inventory

Table 3-4 2031 Projected Arvin/Lamont AB 617 Community Emissions Inventory

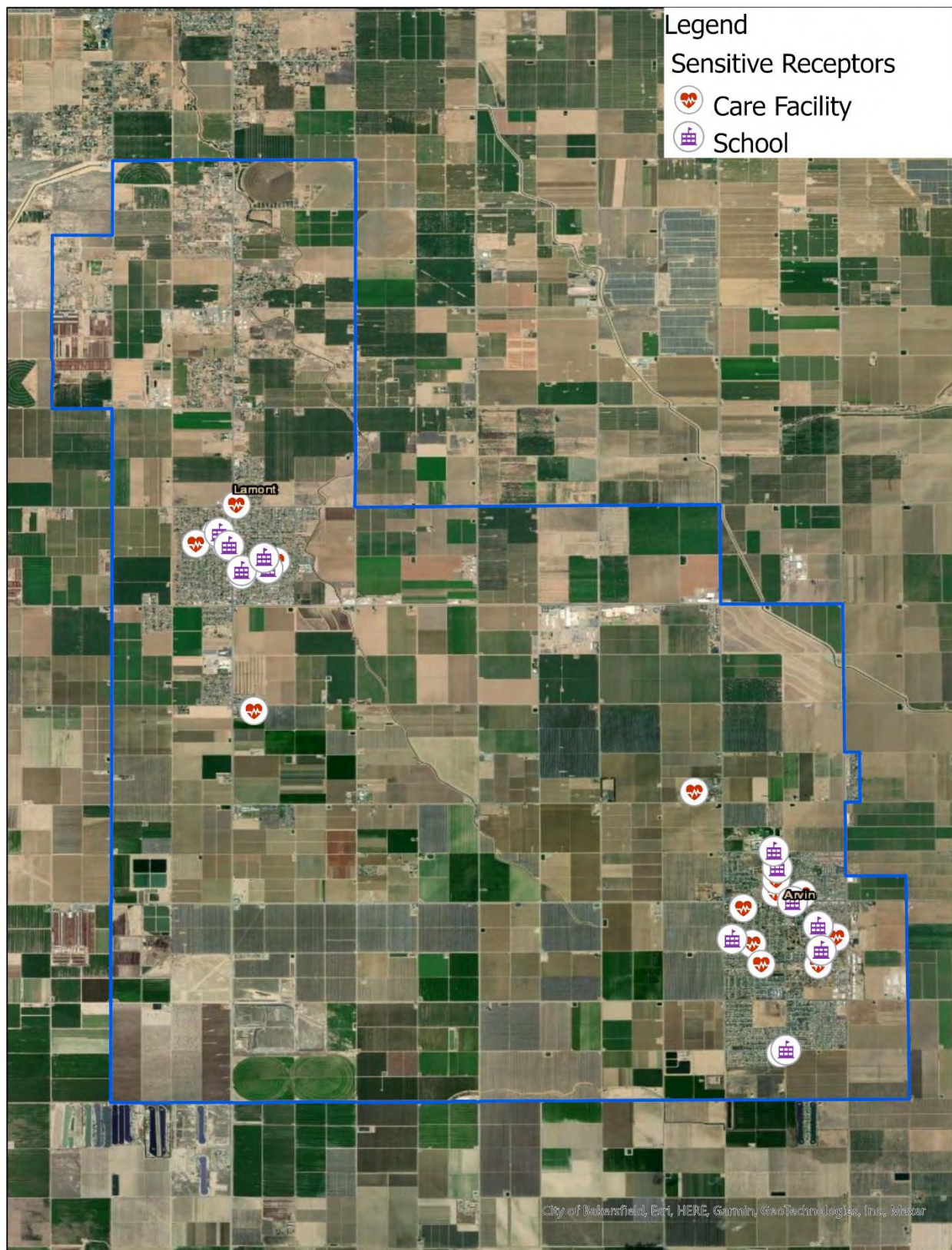
Source Categories	NOx (tpy)	VOC (tpy)	PM2.5 (tpy)
Stationary Sources	38.6	132.0	18.4
Area Source	20.7	1284.5	52.4
Mobile Sources	156.8	66.8	6.0

For further information about the emissions inventory for the Arvin/Lamont AB 617 Community, including the stationary source emissions inventory, projected emissions inventory for District permitted facilities, mobile source inventory, and area-wide sources inventory please refer to Appendix C.

SENSITIVE RECEPTORS

The location of sensitive receptors is important to assess the impacts of emissions on public health. Sensitive Receptors are defined as people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential dwelling unit(s). The map below shows sensitive receptor locations within the community. The sensitive receptors currently in the community include 12 schools and 21 care facilities. Sensitive receptors within the community are located in proximity to mobile on-road sources, manufacturing and industrial sources, off-road mobile equipment, and residential fuel combustion sources.

Figure 3-9 Sensitive Receptor Locations in the Arvin/Lamont Community



Where can I get more information about air pollution in Arvin/Lamont AB 617

Community? To provide detailed community-level data to the Steering Committee and the general public, District staff have created an interactive mapping tool that shows the locations of sensitive receptors, as well as the locations of and emissions inventory for stationary sources, area sources, and both on-road and off-road mobile emissions.

Examples of the emissions data available through this mapping tool are shown in the figures below. Please visit the District website to zoom in and explore the community:

<https://sjvapcd.maps.arcgis.com/apps/instant/sidebar/index.html?appid=2c8ad5b3044d417899b1f256fc5322c0?id=918e82e790e04e2aa64044243b95836b> and

<https://sjvapcd.maps.arcgis.com/apps/webappviewer3d/index.html?id=918e82e790e04e2aa64044243b95836b>

Figure 3-10 District Mapping Tool Showing Types and Locations of Stationary Source Operations in Community

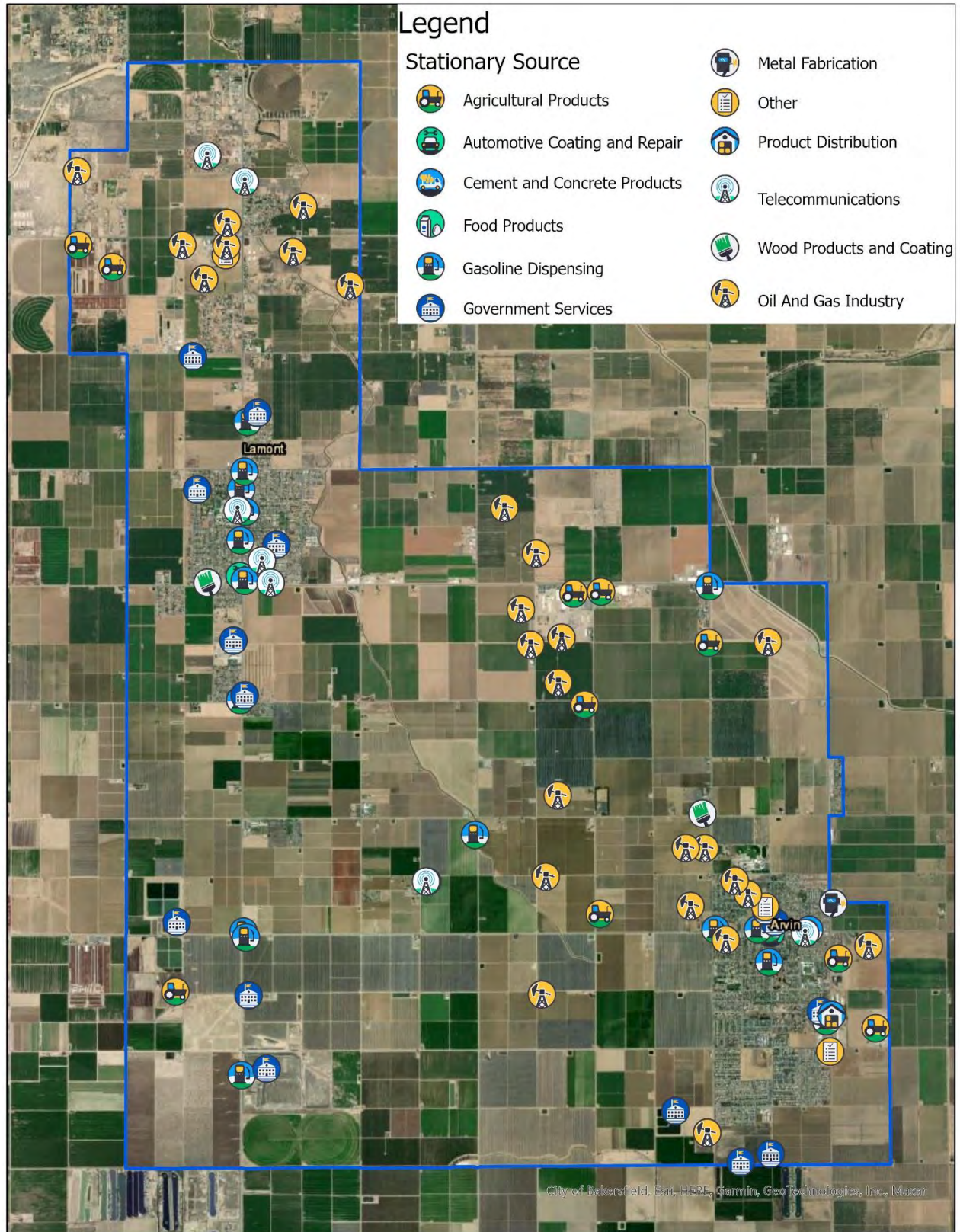
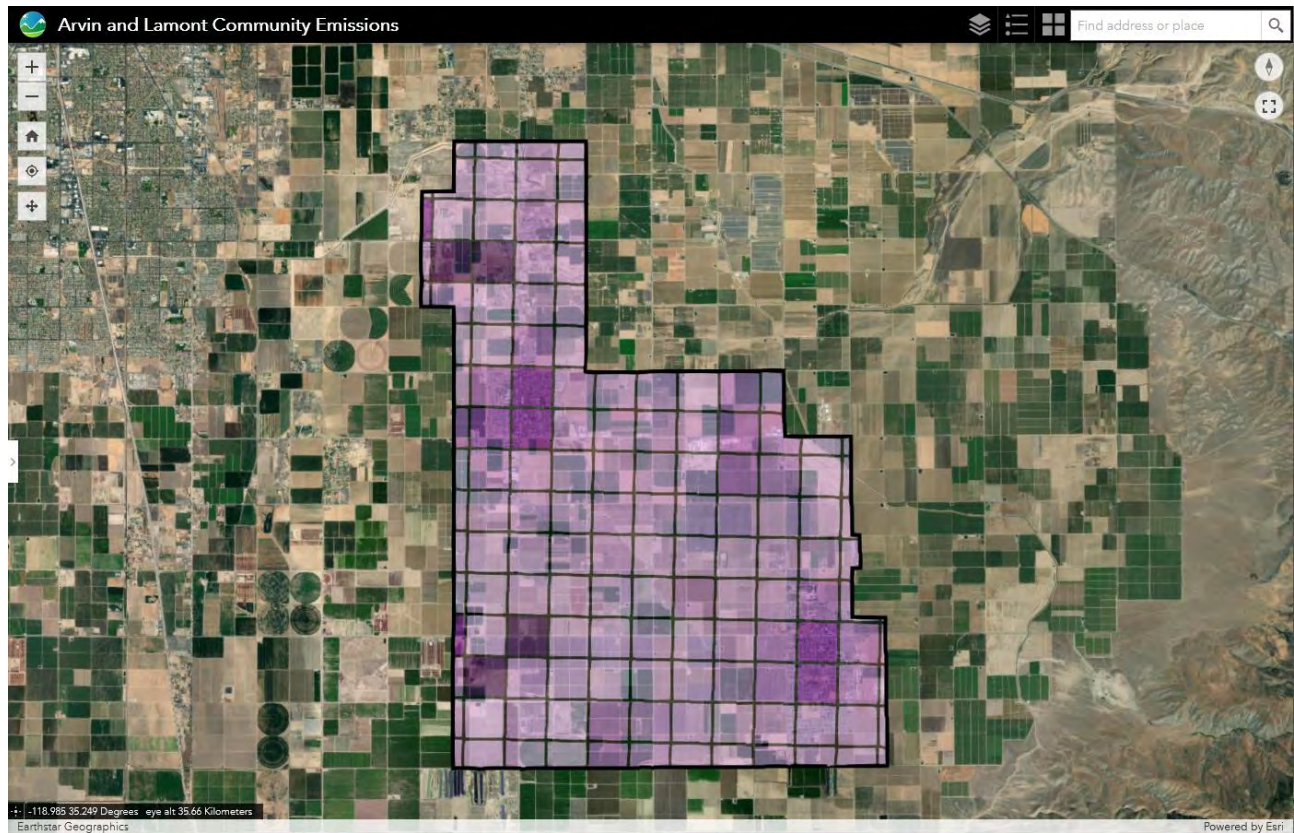


Figure 3-11 District Mapping Tool Showing Concentrations of Area-Wide Emissions within the Community



3.3. EXISTING AIR QUALITY PROGRAMS

DISTRICT PLANS FOR ATTAINMENT OF HEALTH-BASED AIR QUALITY STANDARDS

For more than two decades, the District has adopted numerous attainment plans to reduce ozone and particulate precursor emissions. The District's multifaceted approach to reducing emissions in the San Joaquin Valley consists of a combination of innovative regulatory and non-regulatory measures. The U.S. Environmental Protection Agency (EPA) periodically reviews and establishes health-based national air quality standards (also referred to as NAAQS) for ozone, particulates, and other criteria air pollutants guided by the Clean Air Act. The District has adopted numerous air quality attainment plans over the years that identify measures needed in the Valley to attain EPA's increasingly stringent health-based NAAQS.

The District's plans include emissions inventories that identify sources of air pollutants, evaluations for feasibility of implementing potential opportunities to reduce emissions, sophisticated computer modeling to estimate future levels of pollution, and a strategy for how air pollution will be further reduced. District plans also include innovative alternative strategies for accelerating attainment through non-regulatory measures such as incentive programs; technology advancement programs; the District's legislative platform; community outreach and education programs; and additional strategies such as energy efficiency, eco-driving, green purchasing and contracting, supporting urban heat island mitigation efforts, and encouraging cleaner methods of generating electrical energy and mechanical power.

Measures implemented for these Valley-wide strategies also apply to the AB 617 community of Arvin/Lamont and have resulted in tremendous emissions reductions being achieved, to the benefit of the health of all Valley residents. Most recently, after an extensive 3-year public process, the District, in coordination with CARB and EPA, adopted the *2018 PM_{2.5} Plan*. This historic plan builds on decades of air quality improvement efforts and establishes a comprehensive strategy for continuing to improve the Valley's air quality and meet the latest federal PM_{2.5} standards. Further information on the comprehensive rules, regulations, and other programs that have been developed as a part of the District's attainment planning process are detailed in the District's plans for attainment of state and federal air quality standards, with links provided to each attainment plan below:

PM_{2.5} Plans for Attainment

[2018 Plan for the 1997, 2006, and 2012 PM_{2.5} Standards](#)

The District adopted the *2018 Plan for the 1997, 2006, and 2012 PM_{2.5} Standards* on November 15, 2018. This plan addresses the EPA federal 1997 annual PM_{2.5} standard of 15 µg/m³ and 24-hour PM_{2.5} standard of 65 µg/m³; the 2006 24-hour PM_{2.5} standard of 35 µg/m³; and the 2012 annual PM_{2.5} standard of 12 µg/m³.

[2016 Moderate Area Plan for the 2012 PM2.5 Standard](#)

The District adopted the *2016 Moderate Area Plan for the 2012 PM2.5 Standard* on September 15, 2016. This plan addresses the EPA federal annual PM2.5 standard of 12 µg/m³, established in 2012. This plan includes an attainment impracticability demonstration and request for reclassification of the Valley from Moderate nonattainment to Serious nonattainment.

[2015 Plan for the 1997 PM2.5 Standard](#)

The District adopted the *2015 Plan for the 1997 PM2.5 Standard* on April 16, 2015. This plan addresses EPA's annual PM2.5 standard of 15 µg/m³ and 24-hour PM2.5 standard of 65 µg/m³, established in 1997.

[2012 PM2.5 Plan](#)

The District adopted the *2012 PM2.5 Plan* in December, 2012. This plan addresses EPA's 24-hour PM2.5 standard of 35 µg/m³, which was established by EPA in 2006.

[2008 PM2.5 Plan](#)

The District adopted the *2008 PM2.5 Plan* in April, 2008. This plan addresses EPA's annual PM2.5 standard of 15 µg/m³, which was established by EPA in 1997.

PM10 Plans for Attainment[2007 PM10 Maintenance Plan](#)

The District adopted the *2007 PM10 Maintenance Plan* in September 2007, to assure the San Joaquin Valley's continued attainment of EPA's PM10 standard. EPA designated the Valley as an attainment/maintenance area for PM10.

Ozone Plans for Attainment[2022 Plan for the 2015 8-hour Ozone Standard \(Upcoming Ozone Plan\)](#)

The attainment plan for the 2015 federal ozone standard will build upon comprehensive strategies already in place from adopted District plans and CARB's statewide strategies. The NOx reduction commitments from the recent *2018 PM2.5 Plan* and *2016 Ozone Plan*, and other ongoing measures will assist the Valley in meeting the 70 ppb federal ozone standard. Strategies for attainment of the *2015 8-hour ozone standard* will be developed through a public process, building on decades of effective control strategies. District staff will present regular updates regarding the development of the plan at public meetings and workshops, including upcoming meetings of the District Governing Board, Citizens Advisory Committee (CAC), and the Environmental Justice Advisory Group (EJAG).

[2020 RACT Demonstration](#)

The District adopted the 2020 Reasonably Available Control Technology (RACT) Demonstration for the 2015 8-Hour Ozone Standard on June 18, 2020.

[2016 Plan for the 2008 8-Hour Ozone Standard](#)

The District adopted the *2016 Plan for the 2008 8-Hour Ozone Standard* in June 2016. This plan satisfies Clean Air Act requirements and ensures expeditious attainment of the

75 parts per billion 8-hour ozone standard.

[2014 RACT SIP](#)

The District adopted the Reasonably Available Control Technology (RACT) Demonstration for the 8-Hour Ozone State Implementation Plan in June, 2014.

[2013 Plan for the Revoked 1-Hour Ozone Standard](#)

The District adopted the 2013 Plan for the Revoked 1-Hour Ozone Standard in September, 2013.

[2009 RACT SIP](#)

The District adopted the Reasonably Available Control Technology (RACT) Demonstration for Ozone State Implementation Plans (SIP) in April, 2009.

[2007 Ozone Plan](#)

The District adopted the *2007 Ozone Plan* in April 2007. This plan addresses EPA's 8-hour ozone standard of 84 parts per billion (ppb), which was established by EPA in 1997.

As a result of the District's stringent and comprehensive air quality management strategy along with significant investments made by Valley businesses and residents, PM_{2.5} and ozone levels are now at historically low levels, and the Valley continues to be in attainment of the PM₁₀ NAAQS. Emissions from stationary sources have been reduced by 85%, cancer risk from exposure to air pollutants has been reduced by 95%, population exposure to elevated PM_{2.5} levels have been reduced by 85%, and population exposure to elevated ozone levels have been reduced by 90%. This success in reducing emissions Valley-wide provides assurance that targeted strategies will provide the desired results in helping to improve the air quality in AB 617 selected communities.

[REGULATORY MEASURES](#)

The District has implemented a comprehensive regulatory control strategy for decades. Since 1992, the District has adopted nearly 650 rules and rule amendments to implement aggressive control strategies. Many current rules are fourth or fifth generation, meaning that they have been revised and emissions limits have been lowered numerous times, as new emission control technology has become available and cost effective. Building on decades of developing and implementing effective air pollution control strategies, District rules are required, by the Environmental Protection Agency, to implement the most stringent measures, including best available control measures for new and modified permitting projects, and best available retrofit control technologies for existing equipment when feasible to require in the San Joaquin Valley. The District's stringent and innovative rules have set benchmarks for other air agencies throughout California and the nation. Regulations implemented by the District have reduced emissions from stationary sources by over 80% to date and will continue to achieve significant emissions reductions in the coming years.

District rules reduce emissions of criteria air pollutants and toxic air contaminants from

sources in and around the community. Permitted stationary sources regulated by the District in the Arvin/Lamont AB 617 Community include agricultural commodities storage and transfer operations, petroleum refining operations, composting and waste disposal operations, chemical receiving and storage, fabricated metal parts and products, gasoline dispensing operations, government services, municipal water treatment operations, health care centers, skilled nursing care facilities, and telecommunications facilities. District rules that reduce emissions from local sources in the Arvin/Lamont AB 617 Community are outlined in the following table:

Table 3-5 District Rules Reducing Arvin/Lamont AB 617 Community Air Pollution

Rule #	Rule Description
4001	New Source Performance Standards
4002	National Emission Standards for Hazardous Air Pollutants
4101	Visible Emissions
4102	Nuisance
4201	Particulate Matter Concentration
4202	Particulate Matter Emission Rate
4301	Fuel Burning Equipment
4305	Boilers, Steam Generators, And Process Heaters - Phase 2
4306	Boilers, Steam Generators, and Process Heaters - Phase 3
4307	Boilers, Steam Generators, and Process Heaters - 2.0 MMBtu/hr TO 5.0 MMBtu/hr
4309	Dryers, Dehydrators, and Ovens
4311	Flares
4320	Advanced Emission Reduction Options For Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr
4352	Solid Fuel Fired Boilers, Steam Generators, and Process Heaters
4455	Components At Petroleum Refineries, Gas Liquids Processing Facilities, And Chemical Plants
4601	Architectural Coatings
4603	Surface Coating Of Metal Parts And Products, Plastic Parts And Products, And Pleasure Crafts
4606	Wood Products And Flat Wood Paneling Products Coating Operations
4607	Graphic Arts And Paper, Film, Foil And Fabric Coatings
4612	Motor Vehicle And Mobile Equipment Coating Operations
4621	Gasoline Transfer Into Stationary Storage Containers, Delivery Vessels, And Bulk Plants
4622	Gasoline Transfer Into Motor Vehicle Fuel Tanks
4623	Storage Of Organic Liquids
4624	Organic Liquid Loading
4652	Coatings and Ink Manufacturing
4653	Adhesives And Sealants
4661	Organic Solvents
4672	Petroleum Solvent Dry Cleaning Operations

Rule #	Rule Description
4684	Polyester Resin Operations
4692	Commercial Charbroiling
4693	Bakery Ovens
4701	Internal Combustion Engines - Phase 1
4702	Internal Combustion Engines
4801	Sulfur Compounds
4901	Wood Burning Fireplaces and Wood Burning Heaters
4902	Residential Water Heaters
4905	Natural Gas-Fired, Fan-Type Central Furnaces
8011	General Requirements
8021	Construction, Demolition Excavation, Extraction, and Other Earthmoving Activities
8031	Bulk Materials
8041	Carryout and Trackout
8051	Open Areas
8061	Paved and Unpaved Roads
8071	Unpaved Vehicle/Equipment Traffic Areas
8081	Agricultural Sources
9310	School Bus Fleets
9410	Employer Based Trip Reduction
9510	Indirect Source Review

While California and the federal government have direct authority to regulate tailpipe emissions from mobile sources, the District has also adopted innovative regulations such as the Rule 9510 - Indirect Source Review (discussed in more detail later in this section) and Rule 9410 - Employer-based Trip Reduction to reduce emissions from mobile sources within the District's limited jurisdiction over these sources. A complete listing of the District's current rules and regulations is available at the following link:

<http://www.valleyair.org/rules/1ruleslist.htm>

For the recently adopted *2018 Plan for the 1997, 2006, and 2012 PM_{2.5} Standards* 2018 PM_{2.5} Plan, the District performed an exhaustive evaluation of all potential additional opportunities for reducing emissions and committed to amend several rules to achieve expeditious attainment of the health-based federal PM_{2.5} air quality standards (see Chapter 4). This comprehensive analysis also demonstrated that the District's rules and regulations are at least as stringent, if not more stringent, than all other rules in the nation. Furthermore, in accordance with AB 617 requirements, the District adopted an expedited schedule in December, 2018, for performing further determination of BARCT to ensure that applicable sources are utilizing the cleanest technologies feasible (see Chapter 4).

District New and Modified Stationary Source Review

Beyond District rules that apply to specific categories of stationary sources, District Rule 2201 (New and Modified Stationary Sources Review) applies to all new stationary sources and all modifications to existing stationary sources that are subject to District

permit requirements. District Rule 2201, and the associated permitting process, ensure that new or modified stationary sources of air pollution are subject to the most effective emissions controls feasible for implementation; that emissions from the project do not create a public health risk (including a modeled analysis of cancer risks resulting from the project and possible health hazard risks resulting from both acute and chronic exposure to emissions for nearby residences and worksites); and that the project does not increase the potential for a violation of State or National Ambient Air Quality Standards. More information about the District's rigorous permitting process is available at <http://www.valleyair.org/busind/pto/ptoprocess.htm>, and is also summarized below.

Under Rule 2201, new facilities or facilities modifying equipment must obtain an Authority to Construct (ATC) permit prior to construction, and are subject to stringent requirements, including:

- Best Available Control Technology (BACT)
- Risk Management Review (RMR)
- Toxic Best Available Control Technology (T-BACT)
- Ambient Air Quality Analysis (AAQA)

Best Available Control Technology (BACT): For each emissions unit (specific piece of equipment) that has the potential to emit over the 2 lbs/day BACT threshold, the District requires the use of the best available air pollution control technology commonly used to control emissions from similar types of equipment. The District also conducts an analysis to determine if, based on specific criteria, cleaner technologies that are not commonly used for these type of equipment could be used to further reduce emissions from the proposed equipment. This very stringent requirement ensures that the most effective air pollution control technique is utilized resulting in reduced public exposure to air pollutants and toxic air contaminants.

As a part of the District's BACT Policy, District staff maintain a BACT Clearinghouse, updated and published quarterly, that includes available control technologies and operation methods that meet one of the following conditions:

- A. The control technologies or operation methods have been achieved in practice for an emissions unit and class of source; or
- B. Are contained in any SIP approved by the EPA for an emissions unit category and class of source; or
- C. Are any other emission limitation or control technique, including process and equipment changes of basic or control equipment, found to be technologically feasible for such class or category of sources or for a specific source.

AB 617 legislation requires that CARB develop and maintain a state-wide Technology Clearinghouse for BACT and T-BACT. Once available, District staff will review the Technology Clearinghouse as an additional resource when updating the District's BACT Clearinghouse.

Risk Management Reviews: The District conducts Risk Management Reviews to ensure that the public exposure to toxic air contaminants from projects required to obtain an ATC is less than significant. Very complex computer models and the most conservative assumptions are used to assess the project's maximum impact on resident's health. Projects resulting in estimated significant health risk for the public are not approved. Additional information regarding risk management reviews may be found here: https://www.valleyair.org/policies_per/Policies/apr-1905.pdf

Toxic Best Available Control Technology (T-BACT): When T-BACT is triggered under a Risk Management Review analysis, the District conducts a T-BACT analysis to ensure the most stringent control technique is utilized resulting in reduced public exposure to toxic air contaminants. T-BACT is required for units emitting air toxic emissions that result in a cancer risk of greater than one-in-a-million for nearby residences or businesses. Projects resulting in estimated significant health risk for the public are not approved.

Ambient Air Quality Analysis (AAQA): The U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established [National Ambient Air Quality Standards \(NAAQS\)](#) and [California Ambient Air Quality Standards \(CAAQS\)](#), respectively, for numerous pollutants. Under Rule 2201, the District conducts AAQAs to ensure that project related emissions would not cause or make worse a violation of the State or National ambient air quality standard. This analysis ensures that the public exposure to certain criteria air pollutants is less than the maximum allowed concentration in outdoor air without harm to public.

AB 2588 (Air Toxics Hot Spots Information and Assessment Act)

The District's implementation of [AB 2588](#), California's Air Toxics "Hot Spots" Information and Assessment Act, has resulted in dramatic reductions in emissions of air toxics from existing sources in the San Joaquin Valley. Under this right-to-know law, the District has worked with approximately 5,700 Valley facilities to quantify emissions of air toxics, determine the health risk caused by those emissions, report emissions and any significant risks through written public reports and neighborhood public meetings, and take steps to reduce such risks. As a result of these efforts, and the subsequent reductions in air toxics, since 2007 there have been no Valley facilities identified that pose a significant risk to any Valley resident under the "Hot Spots" program. A detailed discussion of AB 2588 and facility risk reduction audits conducted to date in the community is included in Chapter 4.

Implementation of State Airborne Toxic Control Measures

The District's integrated air toxics program incorporates Airborne Toxic Control Measure (ATCM) regulations promulgated by CARB. State-issued ATCMs are designed to reduce toxic air emissions from various types or categories of equipment by imposing prescribed air pollution control measures. Implementing ATCMs result in reductions of toxics exposure from targeted facility types or categories that could cause significant risks at a regional level. These ATCMs are implemented primarily through the District's permitting process. Examples of emissions sources that have drastically reduced toxic air contaminant emissions in the San Joaquin Valley because of such rules and regulations

include dry cleaners, chrome plating operations, gas stations, and diesel internal combustion engines.

Implementation of Federal National Emissions Standards for Hazardous Air Pollutants (NESHAP) and Maximum Achievable Control Technology (MACT) Standards

The District's integrated air toxics program fulfills federal mandates under Title III of the federal Clean Air Act, which requires specific types of sources of air toxic emissions to directly reduce emissions through federal NESHAP and MACT standards. These standards apply to a variety of source categories, ranging from diesel internal combustion engines to chrome platers, and from refineries to power plants.

Implementation of Federal New Source Performance Standards (NSPS)

The District also fulfills federal mandates under Title I of the federal Clean Air Act, which requires specific types of new, modified, and reconstructed facilities subject to NSPS to directly reduce emissions of criteria air pollutants. These standards apply to a variety of source categories, ranging from hot mix asphalt facilities to sewage treatment plants, and from landfills to boilers.

District Indirect Source Requirements

District Rule 9510 is the only rule of its kind in the State of California and throughout the nation which applies to new residential and commercial development projects. The District's rule is recognized as the benchmark, or best available control, for regulating these indirect sources of emissions, such as from construction equipment and mobile sources associated with new developments. This rule requires mitigation of the growth in emissions from mobile and area sources associated with construction and operation of new development projects in the Valley.

District Air Quality Assistance and Guidance to Public Agencies

The District provides assistance and guidance to other public agencies, including cities and counties in the San Joaquin Valley, to help them assess, minimize, and mitigate air quality impacts of projects undergoing their land-use approval processes, over which the District has no statutory authority. For instance, the District provides comments under the California Environmental Quality Act (CEQA) to public agencies on hundreds of proposed projects each year. District provided CEQA comments are designed to minimize project related air quality impacts. In addition, the District maintains and makes available an extensive suite of guidance documents and tools for assessing and mitigating air quality impacts, including criteria and air toxic emissions, from stationary source projects and other development projects.

Mobile Source Regulations

Mobile source emissions make up over 85% of the Valley's NO_x emissions, the primary driver in the formation of particulate and ozone pollution, therefore, reductions in mobile source emissions have become an ever-increasingly important part of the Valley's attainment strategy of federal air quality standards. States and the federal government, unlike the District, have the authority to directly regulate tailpipe emissions from mobile sources. CARB has adopted toughened regulations for heavy-duty trucks, off-road

equipment, and other mobile sources. Additionally, the District has adopted innovative regulations such as the Indirect Source Review and Employer-based Trip Reduction rules to reduce emissions from mobile sources within the District's limited jurisdiction over these sources. Local air districts do not have the authority to implement regulations requiring ultra-low tailpipe emissions standards on mobile sources.

With authority to regulate mobile source emissions, CARB has adopted and amended a number of regulations aimed at reducing exposure to diesel PM and NOx from fuel sources, freight transport sources like heavy-duty diesel trucks, transportation sources like passenger cars and buses, and off-road sources like large construction equipment. Phased implementation of these regulations will produce emission reduction benefits in the coming years as the regulated fleets are retrofitted, and as older and dirtier fleet units are replaced with newer and cleaner models at an accelerated pace. CARB's ongoing comprehensive measures to reduce emissions from mobile sources throughout the state are detailed further in Chapter 4, "Statewide Strategies" section.

BARCT EXPEDITED SCHEDULE

In addition to community monitoring and emission reduction program requirements, AB 617 requires that air districts located in non-attainment areas perform a Best Available Retrofit Control Technology (BARCT) analysis for all categories of units at facilities subject to the state Cap-and-Trade program. In accordance with AB 617 requirements, the District adopted an expedited schedule for performing further determination of BARCT requirements in December 2018.

The District utilized an extensive evaluation process to make an initial determination of whether the rules that apply to Cap-and-Trade facilities meet all state BARCT requirements, as mandated by AB 617. While District rules are expected to meet BARCT due to the District's ongoing extensive regulatory evaluations, the proposed BARCT implementation schedule includes commitments to establish updated BARCT determinations for District rules as required under AB 617. The proposed schedule was prepared through a public process, which included two public workshops. In addition to the BARCT implementation schedule, the District will be proceeding with amending a number of District rules included as commitments in the District's *2018 PM_{2.5} Plan*, as discussed earlier in the CERP, that are also subject to the AB 617 BARCT implementation requirement.

In conjunction with District rules applicable to stationary source equipment, under the District's New Source Review permitting regulation, new facilities or facilities modifying equipment that emit air pollutants greater than 2 pounds per day (lbs/day), are subject to stringent emissions control requirements. For each piece of equipment that has the potential to emit over the 2 lbs/day threshold, the District requires the use of the best available air pollution control technology (BACT) used to control emissions from similar types of equipment. As part of this BACT analysis, the District determines if cleaner technologies that are not generally used for the equipment being analyzed could be used to further reduce emissions from the proposed equipment. This very stringent requirement ensures that the most effective air pollution control technique is utilized, resulting in the least amount of air pollution possible.

In addition to these stringent requirements on new sources of air pollution, rules adopted in the San Joaquin Valley are regularly analyzed for compliance with the state's BARCT requirements.

Best Available Retrofit Control Technology (BARCT)

Existing stationary sources in non-attainment areas such as the San Joaquin Valley have been subject to BARCT requirements since the 1980s, as opposed to some nonattainment areas in California relying on market-based criteria pollutant emission reduction programs and where facilities were not required to comply with BARCT. Although AB 617 does not specifically define BARCT, California Health and Safety Code (CH&SC) Section 40406 defines BARCT as follows:

Best Available Retrofit Control Technology (BARCT) is an air emission limit that applies to existing sources and is the maximum degree of reduction achievable, taking into

account environmental, energy and economic impacts by each class or category of source.

Unlike other regions in the state, the District has not relied on market-based systems such as South Coast AQMD's RECLAIM program to achieve regional emissions reductions needed for attainment. Such market-based systems allow sources of pollution to avoid installing BARCT-level controls if regional emissions are reduced at an established rate. This potential path to avoiding installing the best air pollution controls in other air districts was a significant portion of the genesis of this BARCT requirement of AB 617.

In contrast, businesses in the San Joaquin Valley have always had to comply with BARCT in accordance to the implementation schedules established in District rules. When developing attainment plans or amending prohibitory rules, the District evaluates all applicable sources of emissions for potential strategies to reduce emissions. These evaluations include an exhaustive search of air quality regulations throughout the nation, review of existing emission control technologies, and analysis of advanced emission control technologies that may soon be available, to identify potential technologically and economically feasible emission reduction measures. The District's attainment planning efforts rely on these processes to demonstrate on an ongoing basis that District rules meet state and federal emission control requirements, including BARCT and Most Stringent Measures, which exceeds BARCT requirements. Therefore, given the District's ongoing and extensive work to identify and apply most stringent measures necessary to attain the ever-tightening federal health-based standards under the Clean Air Act, it is anticipated that most if not all District rules satisfy BARCT requirements.

The District recognizes that emission control technologies are continually evolving, and therefore, robust and ongoing analysis is necessary to demonstrate that the District's rules continue to meet BARCT and other requirements on an ongoing basis. Furthermore, in the context of the 2016 Ozone attainment plan, the adopted PM2.5 attainment plan, and upcoming plans, future rule development actions will be required and, in this process, rules that have recently been determined to meet BARCT during this AB 617 analysis may be subject to further analysis to ensure they continue to meet BARCT requirements. Additionally, in those instances where the District is made aware of new technology, further case specific and rule specific BARCT determinations may be conducted.

Affected Rules Included in the District's Expedited BARCT Implementation Schedule

As captured in Section 40920.6 of the Health and Safety Code, AB 617 identifies specific requirements for the District to meet when establishing the expedited BARCT implementation schedule. AB 617 requires the schedule to apply to each industrial source that, as of January 1, 2017, was subject to a specified market-based compliance mechanism and give highest priority to those permitted units that have not modified emissions-related permit conditions for the greatest period of time.

Based on information provided by CARB, as of January 1, 2017, 109 facilities within the

District were identified as being subject to the state Cap-and-Trade program for greenhouse gas emissions, a market-based compliance mechanism adopted by the state board pursuant to subdivision (c) of Section 38562, and therefore AB 617 BARCT requirements. Evaluating the 109 affected facilities, the District identified that approximately 4,500 active permit units are within the scope of this BARCT analysis. From the 4,500 active permit units, the District determined that 32 District rules that apply to specific source categories of equipment were subject to the BARCT analysis required under AB 617.

District staff performed analysis of 32 affected rules and determined that:

- 5 rules were superseded by a more stringent rule known to meet BARCT or by a rule subject to further BARCT analysis,
- 5 rules were determined to meet Most Stringent Measures (MSM) for NO_x, the only relevant pollutant for these affected rules and, therefore, meet BARCT, and
- 19 rules were specifically determined to meet BARCT through an extensive rule and source category evaluation that compared our rule requirements with federal and state air quality regulations and with regulations of other air districts in California.
- While the remaining 13 rules likely already meet BARCT due to the District's ongoing and extensive regulatory evaluations and enhancements, the proposed BARCT implementation schedule includes commitments to establish updated BARCT determinations for these rules, which will occur in the 2020-2022 timeframe.

Prioritization Criteria for Expedited BARCT Analysis Schedule

Section 40920.6(c)(3) of the Health and Safety Code requires Districts to give highest priority to conduct the BARCT analysis to those rules affecting permitted units that have not modified emissions-related permit conditions for the greatest period of time. To assist in further prioritization, the District also considered local public health, clean air benefits to the surrounding community, and regional air quality and attainment benefits by prioritizing units that emit NO_x and are located within communities selected for action under AB 617. In addition, while cost-effectiveness of controls can't be fully analyzed until each rule is addressed during the development of a BARCT rule, the District also prioritized rules with the greatest number of potentially affected units, which, when coupled to the law's requirement of prioritizing based on the length of time since the units were last modified, provides some consideration of the most likely controls to be cost-effective.

Public Process

As a part of the public process associated with establishing this schedule, the District conducted a public scoping meeting on June 14, 2018, to solicit input from stakeholders regarding the District's proposed methodology to address the AB 617 requirement to adopt an expedited BARCT analysis schedule by the end of 2018.

The District held a public workshop on November 1, 2018, to solicit input from the stakeholders regarding the Districts proposed expedited BARCT Rule implementation

schedule. No comments were received from stakeholders after this workshop.

In addition, the District held a public workshop on July 30, 2020, to provide an update on the BARCT analysis of District rules as required under AB 617 and the District's Expedited BARCT Implementation Schedule.

Expedited BARCT Implementation Schedule

Through this public process and in accordance with AB 617 requirements, the District has adopted the following expedited BARCT implementation schedule:

Table 3-6 District Expedited BARCT Schedule

Rule	Title	BARCT Determination Status	BARCT Determination Schedule	BARCT Rulemaking Schedule (if necessary)
4454	Refinery Process Unit Turnaround	Rule determined to meet BARCT	2019	---
4641	Cutback, Slow Cure, And Emulsified Asphalt, Paving And Maintenance Operations	Rule determined to meet BARCT	2019	---
4104	Reduction of Animal Matter	Rule determined to meet BARCT	2019	---
4409	Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities	BARCT evaluation completed, rule development process necessary	2019	Public workshop held March 10, 2022. Development process to be completed in 2022.
4455	Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants	BARCT evaluation completed, rule development process necessary	2019	

Rule	Title	BARCT Determination Status	BARCT Determination Schedule	BARCT Rulemaking Schedule (if necessary)
4702	Internal Combustion Engines (VOC only)	Scheduled (in conjunction with PM2.5 Plan commitment)	2020	Rule adopted August 2021
4623	Storage of Organic Liquids	BARCT evaluation completed, rule development process necessary	2020	Public workshop held March 10, 2022. Development process to be completed in 2022.
4694	Wine Fermentation and Storage Tanks	Rule determined to meet BARCT	2020	-----
4624	Transfer of Organic Liquid	BARCT evaluation completed, rule development process necessary	2020	Public workshop held March 10, 2022. Development process to be completed in 2022.

Rule	Title	BARCT Determination Status	BARCT Determination Schedule	BARCT Rulemaking Schedule (if necessary)
4603	Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts	Rule determined to meet BARCT	2020	-----
4601	Architectural Coatings	Rule determined to meet BARCT	2020	-----
4401	Steam-Enhanced Crude Oil Production Wells	BARCT evaluation completed, rule development process necessary	2021	Public workshop held March 10, 2022. Development process to be completed in 2022.
4566	Organic Material Composting Operations	Scheduled	2021	-----
4625	Wastewater Separators	Scheduled	2021	-----
4621	Gasoline Transfer Into Stationary Storage Containers, Delivery Vessels, and Bulk Plant	Scheduled	2021	-----

Rule	Title	BARCT Determination Status	BARCT Determination Schedule	BARCT Rulemaking Schedule (if necessary)
4402	Crude Oil Production Sumps	Scheduled	2021	-----
4351	Boilers, Steam Generators, and Process Heaters - Phase 1	Rule superseded by more stringent rules, District Rules 4305, 4306, and 4320	-----	-----
4405	Oxides of Nitrogen Emissions from Existing Steam Generators Used in Thermally Enhanced Oil Recovery - Central and Western Kern County Fields	Rule superseded by more stringent rules, District Rules 4305, 4306, and 4320	-----	-----
4406	Sulfur Compounds from Oil-Field Steam Generators - Kern County	Rule superseded by more stringent rules, District Rules 4305, 4306, and 4320	-----	-----
4305	Boilers, Steam Generators, and Process Heaters - Phase 2	Rule superseded by District Rules 4306 and 4320, more stringent rules	-----	-----
4701	Internal Combustion Engines - Phase 1	Rule superseded by District Rule 4702, a more stringent rule	-----	-----

Rule	Title	BARCT Determination Status	BARCT Determination Schedule	BARCT Rulemaking Schedule (if necessary)
4309	Dryers, Dehydrators, and Ovens	Rule determined to meet BARCT	-----	-----
4703	Stationary Gas Turbines	Rule determined to meet BARCT	-----	-----
4306	Boilers, Steam Generators, and Process Heaters - Phase 3	Rule determined to meet BARCT	-----	-----
4307	Boilers, Steam Generators, and Process Heaters - 2.0 MMBtu/hr to 5.0 MMBtu/hr	Rule determined to meet BARCT	-----	-----
4320	Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater Than 5.0 MMBtu/hr	Rule determined to meet BARCT	-----	-----
4311	Flares	Rule determined to meet BARCT	-----	-----
4354	Glass Melting Furnaces	Rule determined to meet BARCT	-----	-----
4408	Glycol Dehydration Systems	Rule determined to meet BARCT	-----	-----

Rule	Title	BARCT Determination Status	BARCT Determination Schedule	BARCT Rulemaking Schedule (if necessary)
4453	Refinery Vacuum Producing Devices or Systems	Rule determined to meet BARCT	-----	-----
4612	Motor Vehicle and Mobile Equipment Coating Operations	Rule determined to meet BARCT	-----	-----
4622	Gasoline Transfer into Motor Vehicle Fuel Tanks	Rule determined to meet BARCT	-----	-----

UPCOMING PM2.5 PLAN RULE AMENDMENT EFFORTS

In addition to the BARCT implementation schedule above, the District will be proceeding with amending two District rules to pursue additional emission reduction opportunities beyond BARCT, included as commitments in the District's *2018 PM2.5 Plan* adopted by CARB into the State Implementation Plan:

Emissions reductions achieved through the implementation of more stringent limits potentially required through these rule amendments will further contribute to reduced exposure to air pollution in the community. Community Steering Committee members, members of the AB 617-selected community, and the general public are encouraged to be involved in the upcoming rulemaking process for these rules.

Table 3-7 Scheduled District Rule Amendments to Reduce PM2.5

Rule	Title	BARCT Status	PM2.5 Plan Rulemaking Schedule
4901	Wood Burning Fireplaces and Wood Burning Heaters	No units subject to AB 617 BARCT analysis. Rule amended in June, 2019.	2019 (Completed)

Rule	Title	BARCT Status	PM2.5 Plan Rulemaking Schedule
4311	Flares	Rule meets or exceeds BARCT	2020 (Completed)
4306 and 4320	Boilers, Steam Generators, and Process Heaters - Phase 3 and Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr	Rule meets or exceeds BARCT	2020 (Completed)
4692	Commercial Charbroiling	No units subject to AB 617 BARCT analysis	2020 (Completed)
4702	Internal Combustion Engines	Rule meets or exceeds BARCT for NOx, updated AB 617 BARCT determination scheduled for VOCs	2021 (Completed)
4352	Solid Fuel-Fired Boilers, Steam Generators and Process Heaters	No units subject to AB 617 BARCT analysis	2021 (Completed)
4354	Glass Melting Furnaces	Rule meets or exceeds BARCT	2021 (Completed)

Further information on the District's expedited BARCT schedule and rule analyses can be found in the staff report presented to the District Governing Board in December, 2018:

http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2018/December/final/13.pdf

PERMITTING: BACT AND T-BACT DETERMINATIONS

The California Air Resources Board (CARB) is developing a Technology Clearinghouse of best available control technology (BACT) and best available control technology for toxic air contaminants (T-BACT) determinations for air districts throughout California. The District will use this Technology Clearinghouse as an additional resource for BACT determinations, and will reference this information when developing BACT and T-BACT technology determinations for any new or modified source permitting processes, including those in the Arvin/Lamont community. More information about the District's stringent new and modified source review process is available in Chapter 3.

FACILITY RISK REDUCTION AUDITS UNDER AB 2588 (AIR TOXICS HOT SPOTS INFORMATION AND ASSESSMENT ACT)

Background

The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) was enacted in September 1987. Under this act, stationary sources are required to report the types and quantities of certain toxic substances their facilities routinely release into the air. The goals of the Air Toxics "Hot Spots" Act are to:

- Identify Valley facilities that release toxic air contaminants as a result of their day-to-day operations
- Collect and quantify emission data from equipment located at permitted facilities
- Identify facilities causing localized health impacts on nearby residents,
- Determine facility-wide health risks resulting from the emission of toxic air contaminants
- Notify nearby residents and businesses of significant risk facilities in their vicinity
- Require significant risk facilities to reduce their risks below the level of significance in accordance with the provisions of the "Emissions Inventory Criteria and Guidelines Report" adopted by the Air Resources Board

District's Implementation of AB 2588

The District's implementation of AB 2588, California's *Air Toxics "Hot Spots" Information and Assessment Act*, has resulted in major reductions in emissions of air toxics from existing sources in the San Joaquin Valley. Under this right-to-know law, the District has worked with Valley facilities to quantify emissions of air toxics, determine the health risk caused by those emissions, report emissions and any significant risks through written public reports and neighborhood public meetings, and take steps to reduce such risks. As a result of this effort, and the resulting emissions reductions, no Valley facility currently poses a significant risk under this program.

The District's integrated air toxics program fulfills the state AB 2588 Hot Spots mandates, aimed at quantifying and assessing localized health risk, notifying affected residents, and reducing risk from facilities with high risk caused by air toxic emissions. In addition, the District's integrated air toxics program incorporates Airborne Toxic Control Measure (ATCM) regulations promulgated by the Air Resources Board, requiring prescribed control measures for various source categories that cause significant risks at a regional level. Furthermore, the District's integrated program fulfills federal mandates under Title III of the federal Clean Air Act, requiring Maximum Available Control Technology (MACT) for sources of air toxics.

In addition to the state and federal mandates, the District's integrated air toxics program also implements the more stringent local permitting and California Environmental Quality Act (CEQA) requirements, specifically to ensure installation of Best Available Control Technology (BACT) for air toxics and that new permits or modifications to existing facilities will not result in a significant increase in health risk to the public.

The District has spent the last two decades implementing a wide variety of methods to

reduce toxic air contaminant emissions in the San Joaquin Valley. Based on the latest California Toxics Inventory, 52% of toxic air contaminants come from mobile sources such as cars and trucks, 34% are emitted from area-wide sources like road dust, paints, solvents, and other consumer products, and 14% of all air toxics in the San Joaquin Valley are emitted from stationary sources of pollution under the direct control and regulation of the District. Mobile and area-wide sources of emissions are generally under the regulatory authority of the State of California and the federal government.

The District's integrated approach to addressing and reducing risks from toxic air contaminants has taken three main paths:

- Reducing air toxic emissions from existing stationary sources of emissions,
- Preventing the creation of new or modified stationary sources of significant risk, and
- Finding creative and cooperative methods of reducing risk from emissions sources that the District does not typically regulate.

In 2016, the District began implementing the state Office of Environmental Health Hazard Assessment's (OEHHA's) revised Guidance on Preparation of Health Risk Assessments that was adopted by OEHHA in early March 2015. Following OEHHA revised guidelines, the District began a health risk reassessment of all facilities located in the San Joaquin Valley. The health risk reassessment follows the phased processing schedule outlined in AB 2588, which was originally implemented in the late 80's and early 90's. AB 2588 subjected three major categories (or phases) of facilities to the regulation based upon their level of annual emissions. The AB 2588 regulation also allows for "Industry-wide" toxics emissions inventory, which consist of facilities that are small businesses where emissions can be generally characterized such as Gasoline Dispensing, Auto Body Coating, etc.

Reassessment of facilities subject to the AB 2588 Hot Spots regulation is a multi-year process that started in 2016, following the phases identified below:

- Phase I Facilities (≥ 25 tons emissions per year)
- Phase II Facilities ($10 \leq$ tons emissions per year < 25)
- Phase III Facilities (< 10 tons emissions per year)
- Phase IV Facilities (Industry-wide, DICE only, Ag facilities)

Prioritizing Facility Health Risks

Based on the emissions inventory, the District is prioritizing each facility's health risk based on established statewide guidelines using a computerized modeling program. A "prioritization" is a conservative health risk assessment screening analysis, resulting in a facility prioritization score used to determine if a more refined health risk assessment is necessary based on the results of the modeling program. As part of this process, very conservative assumptions are utilized, with many safety factors built in to determine the worst-case health risk to possible receptors. The purpose of these safety factors is to ensure that the most sensitive receptors (children, elderly, pregnant women, and people with weakened immune systems) are protected. Facilities ranked as high priority are

required to perform health risk assessments. The District prioritizes and ranks the health risk posed by a facility as "low", "intermediate", or "high" priority, based on the following:

- **Low Priority:**
Prioritization Score ≤ 1
Facility Exempt from further AB 2588 requirements
- **Intermediate Priority:**
 $1 < \text{Prioritization Score} \leq 10$
Facility required to provide updated summary every four years
- **High Priority:**
Prioritization Score > 10
Facility required to perform a refined Health Risk Assessment

Health Risk Assessment Process

When a facility's prioritization score exceeds 10, the facility is classified as "High Priority" and a Health Risk Assessment (HRA) is required for the facility, and such facility is required to submit an HRA for District approval. The District and State Office of Environmental Health Hazard Assessment (OEHHA) are required by the Air Toxics "Hot Spots" Act to review each HRA. Understanding that risk calculations involves a level of uncertainty due to limited data in many areas requiring the use of assumptions. With a focus on health protection, very conservative assumptions are utilized, with many safety factors built in to determine the worst-case risk to possible receptors. The purpose of these safety factors is to ensure that the most sensitive receptors (children, elderly, pregnant women, and people with weakened immune systems) are protected. Therefore, while the actual risk may be much less than the calculated risk, it is very unlikely to be higher than calculated.

Upon approval of facility HRA, the District determines the facility's health risk status, which is classified as a low risk, intermediate risk, high risk, or risk reduction required, based on the following HRA scores:

- **Low Risk:**
HRA cancer risk ≤ 1 in a million, and HRA total hazard index of < 0.1
Facility Exempt from further AB 2588 requirements
- **Intermediate Risk:**
 $1 \leq \text{HRA cancer risk} < 10$ in a million, or $\leq \text{HRA total hazard index} \leq 1.0$
Facility required to provide update summary on a quadrennial basis
- **High Risk:**
HRA cancer risk ≥ 10 in a million, or HRA total hazard index of > 1.0
Public Notice Required
- **Risk Reduction Required:**
HRA cancer risk ≥ 100 in a million, or HRA total hazard index of > 5.0

Public Notice and Risk Reduction Audit Plan Required

Facilities that pose health risks above District action levels are required to submit plans to reduce their risk. The Risk Reduction Audit Plan (RRAP) trigger level for cancer risk is 100 cases per million exposed persons, based on the maximum exposure beyond facility boundaries at a residence or business. The action level (Risk Reduction Audit Plan) for non-cancer risk is a hazard index of 5 at any point beyond the facility boundary where a person could reasonably experience exposure to such a risk.

The District's review of completeness of the facility's RRAP includes a substantive analysis of the emission reduction measures included in the plan, and the ability of those measures to achieve emission reduction goals as quickly as feasible. If the District determines that the RRAP does not meet those requirements, the District shall remand the audit and plan to the facility and specify the deficiencies. A facility operator shall submit a RRAP addressing the deficiencies identified by the District within 90 days of receipt of a deficiency notice. An updated prioritization and/or health risk assessment shall be determined based on the approved RRAP.

Risk Reduction Audit and Plan Facilities within the District

Based on facility information, no District permitted facilities in the Arvin-Lamont AB 617 community present a significant risk for toxic air pollutants and are not required to perform a Risk Reduction Audit and Plan.

AB 617 Community Facility Lists with Associated AB 2588 Designations

Assembly Bill 617 requires the CARB and air districts to develop and implement emissions reporting for disadvantaged communities. With the establishment of the selected community boundaries, the District has put into effect a plan to expedite and streamline the AB 2588 reassessments for facilities located within the selected community of Arvin/Lamont.

Community-Based AB 2588 Reassessments

Based on previous AB 2588 analyses and on the on-going District's integrated air toxics program, no Valley facilities have been determined to pose significant risk. Therefore, no existing facility(s) have or have been required to prepare a Risk Reduction Audit Plan. However, as mentioned above, the District is currently in the process of reassessing Valley facilities under AB 2588, which includes those located in the selected community of Arvin/Lamont.

Please refer to Appendix E for further details about the District's Health Risk Assessment Process, and a table identifying the AB 2588 reassessment status of each facility within the community as of December 21, 2021.

DISTRICT INCENTIVE-BASED EMISSION REDUCTION PROGRAMS

The District has increasingly relied on its advocacy efforts to secure state and federal funding sources, and locally-generated funding to implement incentive programs that have become a vital component of the District's overall strategy for achieving the emissions reductions necessary to bring the Valley into attainment with state and federal air quality standards and to protect public health. These programs provide an effective way to accelerate emissions reductions and encourage technology advancement, particularly from mobile sources, a sector not directly under the District's regulatory jurisdiction. Considering over 85% of the NO_x emissions in the Valley come from mobile sources, these successful voluntary incentive grant programs help the Valley achieve highly cost-effective emissions reductions that are surplus of the regulatory emissions reductions.

The District operates one of the largest and most well-respected voluntary incentive programs in California. Since the District's inception in 1992, considerable funding has been invested into thousands of clean-air projects throughout the Valley. The District's incentive programs offer Valley businesses and residents the opportunity to replace their older, higher polluting equipment with newer, cleaner models. These incentive programs include options for replacing older diesel powered trucks, ag engines, tractors, locomotives, and construction equipment as well as options for replacing wood burning devices, lawn equipment and passenger vehicles. These projects have achieved significant emissions reductions with corresponding air quality and health benefits. The incentive programs listed in the table below have been implemented in the community of Arvin/Lamont AB 617 Community from 2005 to March 28, 2022, achieving over 2,000 tons of combined PM, NO_x, and VOC emissions reductions in the community.

Table 3-8 Grant Funding Invested in Arvin/Lamont AB 617 Community- from 2005 to Mar 28, 2022

Arvin/Lamont AB 617 Community Grant Funding: Incentive Program	Units	Sum of Grant Amount	Total Tons PM, NO _x , VOC Emissions Reduced
Burn Cleaner Wood Stove Change Out New Device	19	\$49,000.00	4.94
Heavy-Duty Ag Burn Alternative	52	\$1,649,623.00	472.73
Heavy-Duty Ag-UTV Vehicle Replacement	39	\$526,257.00	3.34
Heavy-Duty Ag-Engine Replacement	72	\$1,282,214.00	191.66
Heavy-Duty Ag-Engine New Electric	8	\$76,752.00	11.1
Heavy-Duty Infrastructure Alternative Fuel	2	\$440,000.00	0.00
Heavy-Duty Off-Road Ag Vehicle Replacement	149	\$4,389,503.00	707.2
Heavy-Duty Off-Road Engine Repower	24	\$1,297,262.00	366.6

Arvin/Lamont AB 617 Community Grant Funding: Incentive Program	Units	Sum of Grant Amount	Total Tons PM, NOx, VOC Emissions Reduced
Heavy-Duty On-Road New Vehicle	7	\$3,360,000.00	0.00
Heavy-Duty On-Road Prop 1B Vehicle Replacement	29	\$1,270,000.00	169.3
Heavy-Duty On-Road TVP Vehicle Replacement	7	\$334,825.00	67.1
Heavy-Duty School Bus Vehicle Replacement	6	\$1,128,455.00	8.42
Heavy-Duty School Bus Engine Retrofit	64	\$1,038,875.00	0.00
Lawn & Garden Residential New Purchase	4	\$200.00	0.00
Lawn & Garden Residential Replacement	34	\$8,200.00	0.00
Light-Duty Charge Up EV Charger-Private	7	\$166,000.00	0.00
Light-Duty Charge Up EV Charger-Public	6	\$300,000.00	0.00
Light-Duty Drive Clean EV Vehicle Rebate	24	\$72,000.00	0.57
Light-Duty EFMP Replacement	37	\$302,500.00	0.0
Light-Duty TITU Repairs	773	\$437.940.13	0.0
Light-Duty Van Pool Voucher	7	\$2,520	0.00
Public Benefit Alternative Fuel New Vehicle	60	\$974,384.00	0.00
Special Projects Energy Efficiency Block Grant	4	\$5,380.00	0.00
Total	657	\$18,748,930.00	2,002.97

DISTRICT TECHNOLOGY ADVANCEMENT EFFORTS

The District Governing Board approved creation of the Technology Advancement Program in March 2010, to accelerate development of technologies that can help reduce emissions in the Valley. Meeting EPA's increasingly stringent ozone and PM2.5 air quality standards requires significant advancements in low-emissions technologies from mobile and stationary sources. The Technology Advancement Program provides a strategic and comprehensive means to identify, solicit, and support technology advancement opportunities. Ongoing refinement of the program's technology focus areas targets efforts to achieve the greatest impact on the Valley's attainment and other health-based goals. This program has resulted in the development and deployment of electric feed mixers for dairy operations, clean fuel technologies for trucks, and solar-electric truck refrigeration units.

PUBLIC AIR QUALITY EDUCATION AND OUTREACH

Providing accurate and up to date air quality information to Valley residents is a top priority for the District, especially when circumstances such as wildfires overwhelm all clean air measures and lead to high pollution concentrations. Under these circumstances, the best course of action is to provide notifications to Valley residents so that sensitive individuals, in particular, can take precautions to minimize exposure. The District has expended significant resources on public notification and risk prevention measures, such as the Real-Time Air Advisory Network (RAAN) and Real-Time Outdoor Activity Risk (ROAR) Guidelines. The following are some additional examples of District outreach programs designed to help Valley residents understand air quality and what they can do to reduce their own impacts:

- Healthy Air Living Schools
 - <http://www.healthyairliving.com/schools>
- Real-Time Air Quality Display (READ)
- Web-based Archived Air Quality System (WAAQS)
 - <https://www.valleyair.org/waaqs/>
- Healthy Air Living
 - <http://www.healthyairliving.com/>
- Healthy Air Living Partners
- Residential Wood Smoke Reduction
 - www.valleyair.org/burnstatus
- Air Alerts
 - https://www.valleyair.org/AirAlert/AirAlert_Landing.htm

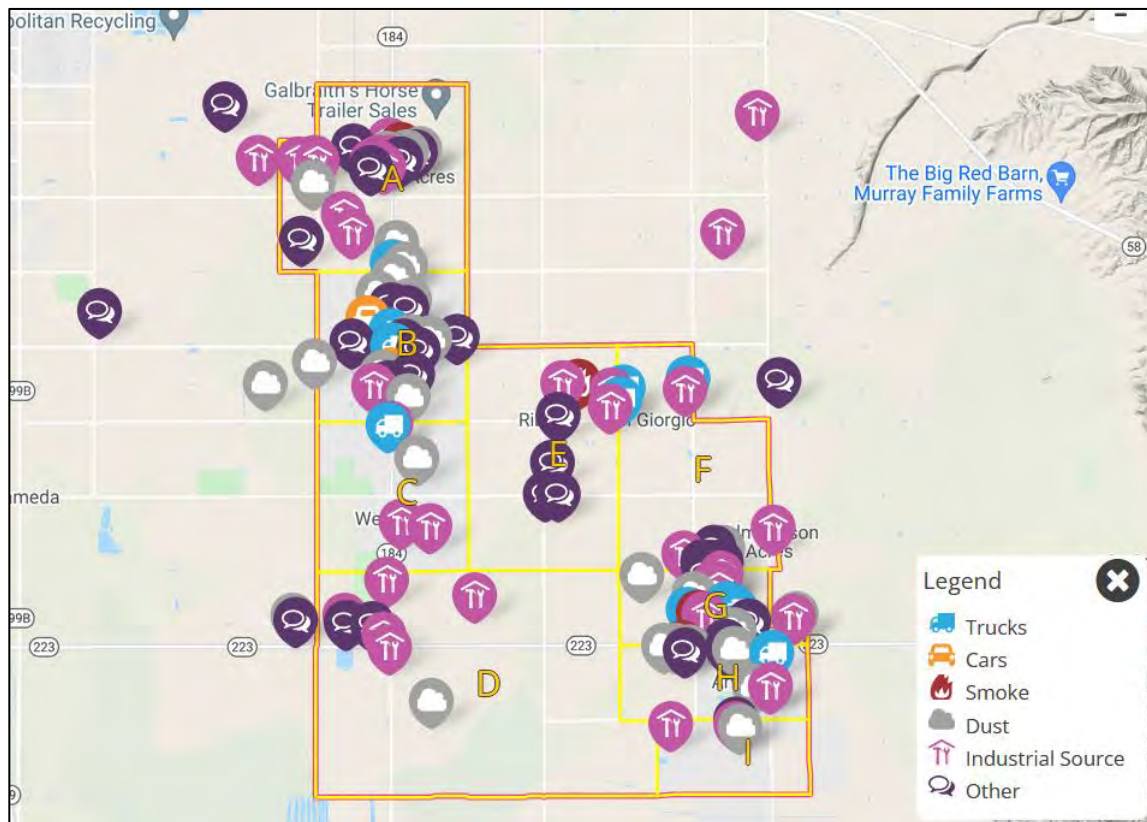
The above programs are available to community members, and have helped residents and school administrators take health protective action during poor air quality episodes.

4. STRATEGIES TO REDUCE THE CUMULATIVE EXPOSURE BURDEN IN ARVIN/LAMONT

COMMUNITY IDENTIFIED AIR QUALITY PRIORITIES

During the July 28, 2021 Community Steering Committee (CSC) meeting, Arvin/Lamont committee members participated in a facilitated exercise to identify and prioritize their air pollution sources of concern. Participants were placed in groups and were asked to share their thoughts regarding air pollution sources which they believed impacted their community the most, or was of most concern to the individual or entity they represented. The results of these group exercises were then placed into an online mapping tool to create a visual representation of the common pollution sources of concern (Figure 4-1). An online version of the exercise was also sent to the committee and posted to the District's community webpage <http://community.valleyair.org> to allow for additional opportunity to participate in identifying source categories of concern.

Figure 4-1 Results of Sources of Concern Exercise



Through these exercises, some top emission sources categories of concern in Arvin/Lamont included in below figure.

Figure 4-2 Top Sources of Concern as Identified by Arvin/Lamont Community Steering Committee



Based on emissions inventory, current air monitoring data, and top sources of concern in this community, pollutants of concern include particulate matter less than 2.5 micrometers in diameter (PM_{2.5}), Black Carbon (BC), Oxides of Nitrogen (NO, NO₂, NO_x), Hydrogen Sulfide (H₂S), Carbon Monoxide (CO), Ozone, Volatile Organic Compounds (VOCs), and pesticides. In addition, a variety of toxic compounds, including toxic organics and particulate matter, were also identified as pollutants of concern.

To provide additional information about existing control programs for community members not familiar with ongoing air pollution control efforts, District coordinated various agency presentations from District permits and enforcement staff, California Air Resources Board (CARB) regulatory and enforcement staff, Department of Pesticide regulation (DPR), and other local agencies. Additionally, the CSC-elected community co-

leads were invited to present their perspectives as community representatives in the form of formal presentations during CSC meetings.

In partnership with the CSC members, community based organizations, businesses in the community, and state and local agencies, a suite of targeted strategies to reduce and mitigate harmful air pollution emissions from community identified sources of concern has been developed. Some of which were suggested by the District and CARB in response to CSC identified sources of concern, and many of which came directly through suggestions made by CSC members. In addition to the emission reductions which will be achieved through expedited implementation of best available retrofit control technology by facilities within the community, the adoption of rule amendments that will further reduce PM2.5 and toxics in the Valley, and enhanced enforcement (additional/targeted enforcement efforts) in the community, these local measures provide accelerated emissions reductions in the community.

AB 617 legislation requires that a CERP identify cost-effective measures to achieve emission reduction targets in the community. During CSC discussions to review potential strategies for implementation in the community, CSC members consistently supported and prioritized measures that would reduce emissions from residential sources, while also providing tangible benefits to residents in the community. The measures described in this chapter encompass a range of strategies to reduce community level exposure burden, including regulatory, enforcement, outreach and education, voluntary incentive-based programs, as well as partnerships with other agencies to address issues outside of the District's direct regulatory authority.

It should be noted that the identified funding amounts for each measure are designed assuming that future-year state budget appropriations and funding allocations are similar to those approved by the legislature and CARB for current use in the AB 617 program, and are available in future District budget appropriations.

Incentive program guidelines also generally contain strict requirements that include specific project types and funding amounts. Some of the incentive measures included in the CERP are proposed to operate under existing authority and approved program guidelines, while other measures will require the development of new program guidelines and associated approval by the District Governing Board and CARB. As the CARB Blueprint states, CARB and the District will continue developing regulatory and incentive actions through separate public processes. Subsequent implementation of proposed CERP measures will be conditional on the successful completion of applicable public processes, necessary financing approvals, technical feasibility analyses, economic competitiveness, safety, and environmental reviews.

ONGOING ENGAGEMENT AFTER CERP ADOPTION

The District will continue to work with the CSC to receive community input as program guidelines are developed and projects are implemented within the community. To support implementation of the Arvin/Lamont CERP, the District, CARB, and other implementing agencies will coordinate with the CSC to establish subcommittees as needed to provide

more focused technical advisory support in the development of strategies approved under the CERP. In addition to the technical support provided by the District, CARB, and other supporting agencies, these subcommittees may provide opportunities for technical advisory support from third-party technical experts, including academia, engineers, technology providers, and others as necessary.

As experience is gained in implementing the measures contained in the CERP, it may become evident that certain measures are more successful than others in reducing emissions and/or exposure, and are more popular with the community. Committee input on these considerations, and discussions about funding availability and cost-effectiveness/benefits of these projects, may lead to the CSC recommending adjustments to strategy goals and/or funding amounts to achieve overall emission reduction goals of the CERP. A possible example includes the collection and sharing of community air monitoring data, which could lead to additional discussion with the CSC, which could lead to additional CERP strategy development.

During CERP implementation, the CSC will be provided regular updates on implementation progress and their feedback and guidance requested. Based on the updates, it is possible that new strategies could be identified or revisions to existing strategies may be appropriate.

The sections that follow provide detailed information about emission and exposure reduction strategies developed for each source category of concern to the community.

4.1. INCENTIVES – HEAVY-DUTY MOBILE SOURCES & AG OPERATIONS

HEAVY-DUTY MOBILE SOURCES IN ARVIN/LAMONT

There are a variety of heavy-duty mobile sources operating in and around the Communities of Arvin and Lamont, cluing on-road heavy-duty trucks, school and transit buses, and off-road equipment, including agricultural and construction equipment. This equipment is primarily powered by diesel engines and, depending on the specific category, is regulated by one or more statewide regulations.

Emissions from this source category are primarily from the internal combustion engines and include oxides of nitrogen (NOx) and combustion PM. Mobile sources account for more than 85% of the NOx inventory throughout the Valley ([Appendix C – Source Apportionment and Community](#)). In the Arvin/Lamont community, 165.30 tons per year of NOx, 10.64 tons per year of VOC and 4.40 tons per year of PM2.5 are attributed to on-road heavy-duty equipment. In addition, 32.50 tons per year of NOx, 5.47 tons per year of VOC and 1.88 tons per year of PM2.5 are attributed to off-road heavy-duty equipment referenced in these measures.

Figure 4-3 Examples of Heavy-Duty Mobile Sources



COMMUNITY CONCERNS AND COMMENTS

During the committee discussions regarding heavy-duty mobile sources, a majority of the committee ranked this source as a high priority to address. Committee member comments and suggestions included providing incentives to replace older trucks, clean fleet requirements, and shifting trucking routes away from residents.

CURRENT CONTROL PROGRAMS

The District does not have regulatory authority of emissions from mobile sources, including heavy-duty vehicles and equipment, locomotives, school and transit buses. Diesel powered on-road heavy-duty vehicles are subject to the statewide CARB Truck and Bus Regulation, which requires all equipment to get progressively cleaner over time. Off-road heavy-duty equipment is subject to the CARB Off-Road Regulation, which requires all fleets to be upgraded to newer, cleaner technologies over time.

Due to the large amount of pollution that can be attributed to mobile sources, the District has implemented a broad suite of voluntary incentive programs, targeted at reducing

emissions from heavy-duty engines operating throughout the Valley.

Heavy-Duty Trucks/Buses:

The District currently offers a variety of programs targeted at replacing or upgrading older, high-polluting trucks and buses with cleaner technology.

- The Heavy-Duty Truck Replacement Program <http://valleyair.org/grants/truck-replacement.htm>. This program provides incentives for the replacement of existing heavy-duty diesel trucks with new, zero or near-zero-emission technology.
- Program for Heavy-Duty Alternative Fuel Infrastructure, <https://www.valleyair.org/grants/Clean-Vehicle-Fueling-Infrastructure-Program.htm>, which provides local businesses and agencies incentive funding to install alternative fueling infrastructure (electric, natural gas, hydrogen, etc.) to support the increased deployment of heavy-duty advanced clean technology vehicles.
- Electric School Bus Incentive Program - <http://valleyair.org/grants/electric-school-bus.htm>. This program is operated by the District and provides incentives for the replacement of existing older, higher-polluting school buses with new, electric school buses.
- Volkswagen Mitigation Trust – <http://vwbusmoney.valleyair.org/>
The VW Mitigation Trust has \$130 million in funds to replace older, high-polluting transit, school, and shuttle buses with new battery-electric or fuel-cell buses.
Replacing an older bus with a zero-emission bus eliminates particulate matter and other pollutants that impact children and residents riding the buses, as well as residents throughout California communities. This statewide program is being administered by the District.

Agricultural Equipment:

The District offers the following programs targeted at replacing or repowering agricultural equipment in the Valley:

- Heavy-Duty Program Agricultural Tractors - <http://valleyair.org/grants/documents/tractor/Guidelines.pdf>. Agricultural tractor replacements can be funded as an eligible project category utilizing funding provided to support AB 617. These projects are administered according to the Carl Moyer Program guidelines and are subject to additional requirements contained within the approved AB 617 Community Air Protection Guidelines. This program is operated by the District.
- FARMER Ag Truck Replacement Program - <http://valleyair.org/grants/documents/FARMER/guidelines.pdf>. This program

provides incentive funds for the replacement of heavy-duty diesel agricultural trucks. Eligible agricultural trucks must be in current compliance with the State of California's On-Road Truck and Bus Regulation. These projects are administered according to the FARMER Program guidelines and this program is operated by the District.

- Low-Dust Nut Harvester Incentive Program - <http://valleyair.org/grants/low-dust-nut-harvester.htm>. This program provides incentives for the replacement of older, conventional harvesters or sweepers with new, low-dust technology equipment. This incentive program helps to reduce dust emissions during harvest time, and can be packaged with the District's Tractor Replacement funding to upgrade tractors used to pull harvesting equipment.

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

Due to the priority that community members placed on reducing emissions from this source category and the large amount of emissions, including PM_{2.5} and toxic air contaminants (particularly diesel PM) that originate from heavy-duty mobile sources in and around the community, the following strategies have been developed for implementation in the Arvin/Lamont community.

MEASURE 1.A HEAVY-DUTY TRUCK REPLACEMENT

Overview: The goal of this strategy is to reduce emissions from heavy-duty diesel trucks operating in the Arvin/Lamont community. This strategy would provide enhanced outreach and access to incentive funding for zero and near-zero emissions, clean truck technologies that are domiciled and operating within the community. District Board-approved methodology and funding levels can be utilized and the District will encourage small business owners to participate in the program while also promoting the selection of all-electric, zero emission technology. This measure would replace 30 older, heavy-duty diesel trucks operating in Arvin/Lamont with zero or near-zero emission technology at an expected average cost of \$200,000 per truck. Where feasible and available for the truck type and duty-cycle, the District will prioritize funding for replacement with zero-emissions electric vehicle technologies. By reducing or eliminating emissions from heavy-duty diesel trucks, significant PM_{2.5}, diesel particulate matter, and NO_x emissions reductions can be achieved.

Implementing Agency: Valley Air District

Type of Measure: Incentives

Budgeted Amount: \$6,000,000

Quantifiable emission reductions: Estimated emissions reductions associated with this measure includes up to 2.4 tons of PM (including toxic diesel particulate matter), 114.9 tons of NO_x, and 8.4 tons of VOCs.

MEASURE 1.B SCHOOL BUS REPLACEMENT

To provide increased outreach and access to incentive funding for the replacement of older, high polluting school buses with new zero-emission school buses servicing the Arvin/Lamont community.

Replacing older school buses is important to reduce children's exposure to diesel emissions including NOx and PM2.5 as these pollutants negatively impact human health, especially for sensitive populations such as children. New, zero-emission battery electric and near-zero emission natural gas powered school buses are significantly cleaner than older diesel buses.

Emissions from school buses are regulated by the California Air Resources Board Statewide Truck and Bus Regulation that requires transition to cleaner technology over time. Generally phased in by model year.

<https://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm>

This measure would cover up to 100% of the cost of replacing up to 4 diesel school buses with electric buses at \$400,000 each.

Implementing Agency: Valley Air District

Type of Measure: Incentives

Implementation: 2022-2026

Budgeted Amount: \$1,600,000

Quantifiable emission reductions: Estimated lifetime emissions reductions associated with this measure includes up to 0.1 tons of PM, 7.2 tons of NOx, and 1.4 tons of VOCs.

AGRICULTURAL OPERATIONS IN ARVIN/LAMONT

The San Joaquin Valley's natural environment supports one of the most productive agricultural regions in the country; the Sierra Nevada provides the necessary water for growing the abundance of crops, and a temperate climate provides a long growing season. The community of Arvin/Lamont is set among dairies, orchards, and other farming operations. These activities generate emissions from the use of diesel-fired internal combustion engines used to power agricultural pumps for irrigation, open burning, trucks, tractors, dairy operations, dust from orchards, vineyards, and row crops, and other agricultural activities.

Agricultural source categories include fuel combustion, industrial processes, farming processes, and pesticides/fertilizers. Particulate matter (PM) emissions are caused by harvesting operations, tilling operations, livestock husbandry, and from fugitive dust. Emissions also include volatile organic compounds (VOCs) from animal husbandry, pesticides, and fertilizers; as well as oxides of nitrogen (NOx) and combustion PM from farm equipment.

In the Arvin/Lamont community, 32.5 tons per year (tpy) of NOx, 5.47 tpy of VOCs, and 1.88 tpy of PM_{2.5} are attributed to heavy-duty farm equipment emissions. Other farming operations, including harvesting, tilling, and husbandry, account for 14.9 tons per year of PM_{2.5}.

COMMUNITY CONCERNS AND COMMENTS

Community members expressed concerns regarding the adverse health effects resulting from emissions generated at dairies and farming operations in the area. Priority areas of concern expressed by Steering Committee members during meeting discussions and feedback exercises include dairy operations, dust generated from orchards and land farming, and pesticide applications.

CURRENT CONTROL PROGRAMS

Current District rules regulating open burning, internal combustion engines, dairy operations, and dust from orchards, vineyards, and row crops are as follows:

- 4101 Visible Emissions
- 4103 Open Burning
- 4550 Conservation Management Practices
- 4570 Confined Animal Facilities
- 4702 Internal Combustion Engines

Additionally, a variety of incentive programs are available for alternatives to open burning, the replacement of agricultural tractors, trucks, pumps, and nut harvesters or sweepers, as further detailed below. Incentive funding is also available for dairy digesters and non-digester manure management practices.

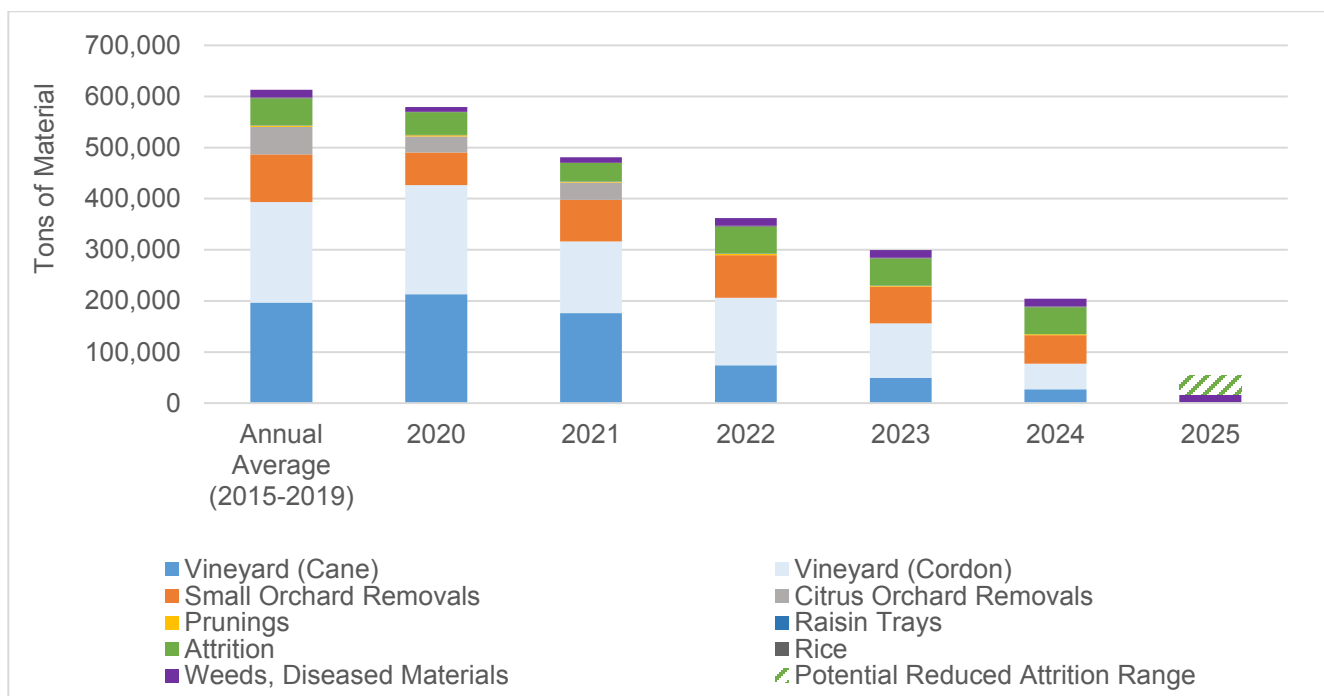
Open Burning

District Rule 4103 (Open Burning) was originally adopted on June 18, 1992, to regulate and coordinate the use of open burning while minimizing smoke impacts on the public. In 2003, California Senate Bill (SB) 705 (California Health and Safety Code (CH&SC)

Section (§) 41855.5 and 41855.6) established a schedule to phase out the open burning of agricultural material, but provided for a postponement of the phase-out where justified by technical and economic impediments. The District incorporated the phase-out requirements of SB 705 into Rule 4103. Rule 4103 also contains requirements for collecting, sorting, drying, and igniting agricultural materials; the timing, monitoring, and maintenance of burns; and specific requirements for field crop burning, ditch bank and levee maintenance, contraband materials, Russian thistle (tumbleweeds), and diseased materials. Additionally, the rule details a set of conditions that must be met for a burn permit to be issued.

On June 17, 2021, in accordance with recent recommendations from the California Air Resources Board (CARB)¹, the District Governing Board approved the *Supplemental Report and Recommendations on Agricultural Burning*, which established an updated schedule for the near-complete phase-out of remaining agricultural open burning in the Valley by January 1, 2025. CARB provided concurrence with the District's strategy on June 18, 2021², and on December 23, 2021, the U.S. Environmental Protection Agency (EPA) proposed to approve the District's updated phase-out schedule into the State Implementation Plan (SIP)³.

Figure 4-4 Projected Annual Open Burn Tonnage



¹ CARB. San Joaquin Valley Agricultural Burning Assessment. February 2021. Retrieved from: https://ww2.arb.ca.gov/sites/default/files/2021-02/Staff_Recommendations_SJV_Ag_Burn.pdf

² CARB. June 18, 2021 Letter providing CARB Concurrence through December 31, 2024. Retrieved from: https://ww2.valleyair.org/media/5lan5hsx/jun-2021-sjv-ag-burn-concurrence-letter_final.pdf

³ EPA. Air Plan Approval; California; San Joaquin Valley Unified Air Pollution Control District; Open Burning. 86 FR 72906. December 23, 2021. Retrieved from: <https://www.govinfo.gov/content/pkg/FR-2021-12-23/pdf/2021-27797.pdf>

Following the near-complete phase-out of open agricultural burning in 2025, the District will continue to allow burning of limited amounts of rice straw (which has the potential for risk of disease), diseased crops and materials, weeds affecting ponding and levee banks, attrition, and weeds and other maintenance, as defined by Rule 4103.

The District uses a comprehensive Smoke Management System (SMS) to manage the Valley's remaining open burning of agricultural crops and materials. On a daily basis, the District analyzes projected local meteorology, the air quality conditions, the atmospheric holding capacity, the amount of burning already approved in a given area, and the potential impacts on downwind populations. Through the results of this daily analysis, the District uses the SMS to manage 97 Valley burn zones and allocates daily burning allowances if appropriate. This approach ensures the District limits the distribution of air pollutant emissions from open burning temporally and spatially, providing flexibility of burn days for growers while minimizing the impact on the public.

Properly managed burning allocations under the SMS ensures that air quality impacts, health impacts, and public nuisance from open burning of agricultural materials are minimized to the fullest extent feasible.

Furthermore, the District's *Alternative to Open Ag Burning Incentive Program* provides incentives for chipping or shredding agricultural material, with the materials being required to be used for soil incorporation or land application on agricultural land. To date, a total of \$48.3 million has been offered to fund these projects which has resulted in approximately 4,270 tons of NO_x, 6,405 tons of VOC, and 7,813 tons of PM emission reductions.

Dust from Orchards, Vineyards, and Row Crops

The District requires that growers implement conservation management practices to reduce air pollution from agricultural operations. Growers must submit a conservation management plan to the District for approval, as required by District Rule 4550 - *Conservation Management Practices*. Within this plan, farmers detail specific measures they will be implementing to reduce dust emissions from their facility. District staff regularly conducts site inspections of Valley farms to ensure compliance with rule requirements.

The District has worked closely with representatives from the agricultural community to evaluate new harvesting equipment and practices that can effectively reduce dust from harvest activities. Based on the significant dust emission reductions that low-dust harvesting equipment can provide, the District is offering funding for the replacement of older, conventional nut harvesters or sweepers with new, low-dust technology equipment for use in nut harvesting operations. This incentive funding can also be packaged with the Ag Tractor Replacement Program funding to upgrade the tractor used to pull harvesting equipment.

Agricultural Tractors

The District's *Ag Tractor Replacement Program* provides incentive funds for the replacement of in-use, off-road mobile equipment that are engaged in agricultural

operations as defined by CARB. Funds are provided on a first-come, first-served basis. Eligible tractor/equipment includes but is not limited to wheel loaders, balers, combines, graders or tractors.

Agricultural Pump Replacement Program

This program provides incentives for engine replacement (repower) of engines/motors used to power agricultural irrigation pumps. The Agricultural Pump Incentive Program provides monetary incentives for the replacement of Tier 3 internal combustion engines (IC engines) to Tier 4f IC engines and Tier 3 IC engines to electric motors. Funds are provided on a first-come, first-served basis. District Rule 4702 – *Internal Combustion Engines* limits the emissions of NO_x, CO, VOC, and SO_x from IC engines.

Agricultural Trucks

Agricultural trucks are controlled by the California Air Resources Board Statewide Truck and Bus Regulation that requires transition to cleaner technology over time. This regulatory transition is generally phased in by model year.

Dairy Operations

Dairy Operations in the San Joaquin Valley are subject to District Rules 4570 – *Confined Animal Facilities*, Rule 4550 – *Conservation Management Practices* and Rule 4101 – *Visible Emissions*.

The purpose of Rule 4570 is to limit VOC emissions from Confined Animal Facilities (CAFs). This rule applies to facilities where animals are corralled, penned, or otherwise caused to remain in restricted areas and primarily fed by a means other than grazing for at least 45 days in any twelve-month period. In addition to limiting VOC emissions, Rule 4570 also includes measures that limit ammonia (NH₃) emissions from these operations. The purpose of Rule 4550 is to limit fugitive dust emissions from agricultural operations. Dairy operations are subject to stringent enforcement provisions, including ongoing mitigation measures and annual inspections. Dairy operations must demonstrate continued compliance with additional visible emissions requirements as described in Rule 4101.

Dairy Digesters

California Department of Food Agriculture (CDFA) Dairy Digester Research and Development Program (DDRDP) provides financial assistance for the installation of dairy digesters in California. CDFA receives funding from California Climate Investments for methane emissions reductions from dairy and livestock operations. Current DDRDP projects are expected to reduce greenhouse gas emissions by an estimated 12.9 million metric tons of CO₂e. These projects also reduce emissions of VOCs and ammonia.

Alternative Manure Management Program (AMMP)

California Department of Food and Agriculture (CDFA) Alternative Manure Management Program (AMMP) provides financial assistance for the implementation of non-digester manure management practices. Currently, eligible practices for funding through AMMP include: pasture-based based management; solid separation or conversion from flush to scrape in conjunction with some form of drying or composting of collected manure.

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

The above control programs will continue to achieve emission reductions throughout the Valley, including in agricultural areas surrounding the community of Arvin/Lamont.

Based on concerns and priorities expressed by the Steering Committee and other community members, the following strategies were developed to reduce emissions from agricultural operations in and around the community of Arvin/Lamont. These strategies are a combination of targeted outreach, new incentive programs, and partnerships with other agencies to reduce emissions and exposure to emissions in the AB 617-selected community.

MEASURE 1.C AG EQUIPMENT REPLACEMENT

Overview: This measure will provide increased outreach and access to incentive funding for the replacement of older, high polluting agricultural equipment (e.g. tractors) operating within and surrounding Arvin/Lamont with new, cleaner equipment through the District's existing Heavy-Duty Engine Incentive Program. Replacing older diesel agricultural equipment (tractors) is important to reduce the public's exposure to diesel emissions including NOx and PM2.5 as these pollutants negatively impact human health, especially for sensitive populations such as children. New agricultural equipment, outfitted with the cleanest available technology reduces emissions from NOx and PM2.5 by more than 90% over the existing technology.

The goal of this action is to replace up to 50 pieces of agricultural equipment operating in and around the community with new, cleanest available technology, utilizing existing Board approved program criteria, according to the Carl Moyer Program guidelines where applicable, and subject to additional requirements contained within the approved AB 617 Community Air Protection Guidelines. The proposed funding would cover up to 80% of the cost of replacing up to 50 pieces of agricultural equipment at an average incentive of \$90,000 each.

Implementing Agency: Valley Air District

Type of Measure: Incentives

Implementation: 2022-2026

Budgeted Amount: \$4,500,000

Quantifiable emission reductions: Estimated emissions reductions associated with this measure include 13 tons of PM2.5 consisting of diesel particulate matter and 186.5 tons of NOx.

MEASURE 1.D ALTERNATIVES TO AG BURNING

Overview: The goal of this strategy is to limit the potential for localized PM_{2.5} impacts associated with open agricultural burning by providing enhanced access to funding for the District's Alternatives to Agricultural Open Burning Incentive Program for growers within Arvin/Lamont community.

This strategy is consistent with Community Steering Committee recommendations to implement strategies focusing on reducing emissions from agricultural open burning. This strategy would provide enhanced access to \$1,400,000 in dedicated funding, utilizing existing Board-approved criteria. This measure would cover up to \$1,400 per acre for up to 1,000 acres of alternative practices and help achieve the ongoing emissions reductions associated with the phase-out of agricultural open burning.

Implementing Agency: Valley Air District

Type of Measure: Incentives

Implementation: 2022-2026

Budgeted Amount: \$1,400,000

Quantifiable emission reductions: Estimated lifetime emissions reductions associated with this measure includes up 110 tons of PM, 58 tons of NO_x, and 100 tons of VOCs.

4.2. INCENTIVES - RESIDENTIAL BENEFITS

LAWN AND GARDEN EQUIPMENT IN ARVIN LAMONT

Small off-road engines (SORE) which are typically utilized in gas powered lawn and garden equipment emit oil-based particulates, PM_{2.5}, NO_x, and a mixture of hydrocarbons, which combine with other gases to form ozone, carbon monoxide and other toxic air contaminants. This equipment can also cause a significant amount of fugitive dust and can increase fugitive emissions including PM, toxic air contaminants, and ultrafine particles resulting in negative health impacts for the user.

According to a 2003 study by the California Air Resources Board, there are over 11.4 million pieces of residential lawn and garden equipment operating throughout the state. In the Arvin Lamont Community the emissions from this sector total 1.8 tons per year (TPY) of NO_x, 15.4 TPY of VOC and 0.17 TPY of PM_{2.5}. These total emissions contribute 0.5 % of the NO_x inventory, 1.1 % of the VOC inventory, and 0.2% of the PM_{2.5} inventory.

Figure 4-5 Electric Yard Equipment Reduces Emissions near Homes and Places of Business



COMMUNITY CONCERNS AND COMMENTS

Community Steering Committee comments regarding Lawn and Garden equipment included better outreach to inform community members of available incentives and increased incentives for the equipment as well as providing opportunities for residents to receive free electric lawn mowers. In addition, Community Steering Committee comments suggested prioritizing residential equipment replacements and ensuring that commercial equipment operated primarily within the boundaries of the AB617 community.

CURRENT CONTROL PROGRAMS

CARB has a SORE program, which includes lawn and garden equipment. In December 2021, CARB approved a measure that will require most newly manufactured SORE found in leaf blowers, lawn mowers and other equipment be zero emission starting in 2024.

<https://ww2.arb.ca.gov/our-work/programs/small-off-road-engines-sore>

In addition, the District offers incentives to help reduce emissions from gas-powered lawn and garden equipment. The Clean Green Yard Machines (CGYM) program provides funding for the following options:

- The residential CGYM provides rebates for the replacement of an old gas-powered mower with a new electric mower and for the purchase of eligible new electric lawn and garden electric equipment without replacements. To date, this program has replaced over 7,400 lawn mowers with over \$1.5 million in funding. <http://www.valleyair.org/grants/cgym.htm>
- The Commercial CGYM launched in May 2019 and provides funding for the replacement of eligible old gas-powered lawn and garden equipment with battery-powered options for public agencies, private entities, and businesses. <http://valleyair.org/grants/cgym-commercial.htm>

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

In order to achieve additional emission reductions from the Lawn and Garden category the District will provide enhanced outreach and access to Arvin Lamont residents or businesses who would like to participate in our available incentive programs. For the residential program, the District proposes to cover the full cost of an electric lawn mower purchase when replacing an existing gas powered mower.

MEASURE 2.A RESIDENTIAL LAWN/GARDEN EQUIPMENT

Overview: The goal of this strategy is to reduce NOx and PM2.5 emissions from residential lawn and garden equipment by replacing existing gas powered units with battery powered zero emission models. The District's existing Residential Clean Green Yard Machines program focuses on this goal by offering incentive funding ranging from \$100-250 for the replacement of existing gas powered units with battery powered zero emission models. Additionally, the District offers up to \$50 for the purchase of a new eligible electric lawn care equipment without requiring an old piece of equipment to be turned in. Using existing District Board-approved criteria, this strategy will provide enhanced outreach and education as well as higher incentive funds to local Arvin/Lamont residents to encourage participation and maximize local emission reductions within the community. This strategy will increase outreach and access to incentive funding while providing rebates up to 100% of the equipment cost of a new electric lawn mower when replacing an existing gas powered model. The goal is to replace 350 gas powered units at an expected cost of \$500 per unit.

Implementing Agency: Valley Air District

Measure Type: Incentives and Outreach

Budgeted Amount: \$175,000

Emission Outcome: Reduction

Quantifiable Emission Reductions: Estimated emissions reductions associated with this measure includes up to 0.1 tons of PM2.5, 0.1 tons of NOx, and 2 tons of VOC.

MEASURE 2.B COMMERCIAL LAWN/GARDEN EQUIPMENT

Overview: The goal of this strategy is to reduce NOx and PM2.5 emissions from commercial landscaping operations, in the Arvin/Lamont AB 617 community, by replacing existing gas powered equipment with battery powered zero emission models. Emissions from commercial lawn care equipment directly affect equipment operators and community residents. The District currently offers a commercial lawn and garden equipment replacement program, which offers incentive funding ranging from \$200-\$15,000 for the replacement of gas powered lawn equipment with battery operated zero emission technology. In addition, the program provides incentive funds for up to two batteries and one charger to ensure that the equipment is capable of operating for a full day of work.

The District will focus on increased participation from small, locally owned businesses and schools in the Arvin/Lamont community to generate immediate emission reductions, which directly affect local residents on a frequent basis. This strategy will provide enhanced outreach and access to available incentive funds offered by the District, utilizing Board-approved criteria. The goal of this measure is to replace 6 pieces of commercial grade gas powered lawn and garden equipment at an expected cost of up to \$25,000 per unit.

Emission reductions associated with this measure will be calculated with CARB-approved methodology.

Implementing Agency: Valley Air District

Measure Type: Incentive and Outreach

Budgeted Amount: \$150,000

Quantifiable Emissions Reductions: Estimated emissions reductions associated with this measure will be calculated based on a methodology currently being developed by CARB.

OLDER/HIGH POLLUTING PASSENGER CARS IN ARVIN LAMONT COMMUNITY

Mobile source emissions account for over 85% of the overall NO_x inventory in the San Joaquin Valley. With no regulatory authority over these sources, the District has relied on voluntary incentive programs to transition older, higher emitting vehicles to newer, cleaner and more fuel efficient models. With limited public transportation options available to residents driving is more prevalent in the Valley than in other areas of the state. Vehicles registered in the Valley are typically older and have higher mileage than statewide averages.

Emissions from light duty vehicles in Arvin Lamont total 19.43 tons per year (tpy) of NO_x, 27.49 tpy of VOC, and 2.84 tpy PM_{2.5}. These total emissions contribute 5.2% of the NO_x inventory, 2.0% of the VOC inventory, and 3.5% of the PM_{2.5} inventory.

Figure 4-6 The District's Drive Clean in the San Joaquin Repair and Replacement Program



COMMUNITY CONCERNS AND COMMENTS

Community Steering Committee comments regarding passenger vehicles included increased outreach and incentives for low income residents, increasing charging infrastructure in the community, and questions about the effectiveness of existing programs for low-income individuals. As detailed below, to address these concerns District staff have developed new programs, specifically for Arvin/Lamont community members, to provide incentive funding for clean-air vehicles, to bring enhanced opportunities for incentives for vehicle repair for low-income residents, to bring car share programs to the community, and create a new incentives program for Ebikes for community residents.

CURRENT CONTROL PROGRAMS

The District does not have regulatory authority of emissions from mobile sources, however, due to the large amount of pollution that originates from passenger vehicles the District has implemented a suite of programs to reduce pollution from mobile sources. These programs include the following measures:

- Tune In Tune Up vehicle repair program which provides incentive funds to repair high emitting vehicles.

<http://valleyair.org/drivecleaninthesanjoaquin/repair/>

- Vehicle replacement program which provides funding to replace older, high emitting vehicles with newer, cleaner and more fuel efficient models.
<https://www.valleyair.org/drivecleaninthesanjoaquin/replace/>
- The vehicle rebate program provides rebates for the purchase or lease of a new clean air vehicle including battery electric, fuel cell, plug in hybrid, zero emission motorcycles, and advanced technology natural gas vehicles.
<https://www.valleyair.org/drivecleaninthesanjoaquin/rebate/>
- Incentives are available for publically accessible charging infrastructure through the District's Charge Up! Program <http://valleyair.org/grants/chargeup.htm>
- The District's Healthy Air Living school program promotes no idling while picking up children at school and provides no idling signs to schools to encourage drivers to turn off their engines.
- District Indirect Source Rule (9510) accounts for mobile source emissions from construction and new development projects and ensures that emissions from these activities are mitigated.
- District Employer based Trip Reduction Rule (9410) requires large employers to implement measures to encourage employees to take alternative transportation to work in order to reduce single occupancy vehicle trips.
- CARB mobile source strategy calls for increasing the deployment of plug in hybrid, battery electric, and fuel cell vehicles in order to attain federal ozone standards, reducing greenhouse gas emissions, minimizing health risks, reducing petroleum usage and increasing energy efficiency.

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

Due to the high priority that community members placed on reducing criteria pollutant and toxic air contaminant emissions that originate from passenger vehicles operating in and around the community, District staff and the Steering Committee have developed targeted strategies for implementation in the Arvin Lamont community. As further detailed below, measures developed include additional incentive funding intended to increase the deployment of electric vehicles through the replacement of gas powered vehicles currently in use; launching an electric vehicle car sharing program; providing additional charging infrastructure throughout the community; providing for electric vehicle maintenance training to increase available repair facilities and job skills; and repairing high polluting passenger vehicles.

The following are proposed measures that are within the Air District's statutory jurisdiction to implement:

MEASURE 2.C INCENTIVES FOR PASSENGER VEHICLE REPAIR

Overview: The goal of this strategy is to reduce emissions of high emitting passenger vehicles that may be in need of repair by providing funding for up to five (5) “Drive Clean in the San Joaquin” Repair Program events within the Arvin/Lamont AB 617 community. Under this program, financial incentives up to \$800 will be available for emissions related testing and repairs for eligible high emitting vehicles. Through the program, weekend testing events (if local pandemic/health protocols allow), will be held to determine if vehicles are in need of emissions related repairs. Approved participants are provided vouchers which can be utilized for the necessary smog tests, diagnostic work and emissions related repairs at participating STAR certified smog shops. Reducing emissions from passenger vehicles is important due to their contribution to the formation of ozone in the Valley.

Implementing Agency: Valley Air District

Type of Measure: Incentives

Budgeted Amount: \$360,000

Quantifiable Emission Reductions: Estimated emissions reductions associated with this measure includes up to 4.1 of NOx.

MEASURE 2.D INCENTIVES FOR PASSENGER VEHICLE REPLACEMENT WITH ELECTRIC OR HYBRID VEHICLES

Overview: The goal of this strategy is to reduce emissions associated with passenger vehicles by replacing 200 vehicles with newer, more fuel-efficient models, and providing additional incentives for Level 2 residential chargers in the Arvin/Lamont community. Emission reductions from passenger vehicles provide benefits to area residents as well as assist in reducing ozone formation in the Valley. Enhanced outreach would be conducted in the Arvin/Lamont community to ensure that residents are fully aware of available incentive options and community residents would be provided priority access through the program in order to complete projects as quickly as possible.

Through the District's existing Board approved "Drive Clean in the San Joaquin" replacement program, incentives are currently offered for low to moderate income residents of disadvantaged communities to replace their older, high polluting vehicle with a newer, cleaner model. The program currently offers up to \$9,500 towards the purchase on an eligible replacement vehicle, with an additional \$2,000 provided to participating residents who purchase or lease a plug-in hybrid electric or a battery-electric vehicle and want to install a Level 2 charger in their home. This program would provide enhanced incentives, up to \$20,000 in total per vehicle, for up to 200 vehicles.

Implementing Agency: Valley Air District

Type of Measure: Incentives and Outreach

Budgeted Amount: \$4,000,000

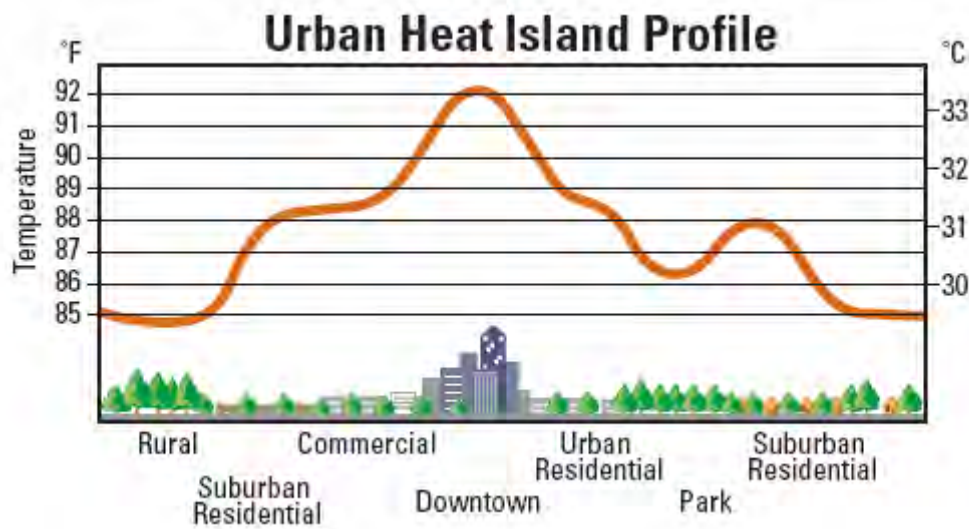
Quantifiable Emission Reductions: Estimated emissions reductions associated with this measure includes up to 1.9 tons of NO_x and 0.1 tons of PM_{2.5}.

4.3. INCENTIVES - COMMUNITY SERVICES

URBAN GREENING

Urban greening is one way to help improve air quality and public health in addition to enhancing the overall beautification of the community with drought resistant low maintenance greenery. Trees and vegetation help reduce the impacts of heat islands by increasing the amount of shade and cooling the air by evapotranspiration.⁴ Careful placement and choice of vegetation will maximize its cooling benefits. Shade provided by trees and other vegetation prevents sunlight from reaching heat-absorbing surfaces such as sidewalks and parking lots, cooling the area by 2 to 9 degrees Fahrenheit. Air quality also benefits from a decrease in energy usage. The less energy used, the fewer power plants running and emitting ozone precursors.⁵ The total net savings when considering energy, ozone, and PM reduced from vegetation were valued at \$210/tree.

Figure 4-7 Urban Heat Island Effect Illustrated (Source: EPA, 1992)



COMMUNITY CONCERNS AND COMMENTS

The steering committees expressed an interest in opportunities for increased urban greening and forestry in the communities of Arvin and Lamont, as a strategy to reduce exposure from emissions that occur along local transportation corridors near sensitive receptors, while keeping in mind water and maintenance issues.

CURRENT PROGRAMS

The District Fast Track Action Plan identified Heat Island Mitigation as a measure to be implemented with the goal to increase urban forest canopy shading and increase the albedo of structures and pavement. This guidance includes a model resolution and

⁴ EPA (1994) *Using Trees and Vegetation to Reduce Heat Islands*. Retrieved 1/21/21 from <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>

⁵ EPA (2008) *Heat Island Compendium*. Retrieved 1/21/21 from <https://www.epa.gov/heatislands/heat-island-compendium>

policy statement for use by businesses, government, and organizations who desire to commit to heat island mitigation strategies.

Due to the benefits of urban greening, there are several programs available to support urban greening in communities. Below are the ongoing efforts to promote Urban Greening by other agencies, as well as programs committed to be implemented in future State and/or Valley-wide programs.

- **California ReLeaf Grants:** California ReLeaf seeks and provides pass-through grants to ReLeaf Network Members and other community groups interested in planting and caring for trees in California and offers grant programs through the Social Equity Grant Program and California Arbor Week Grant.
- **California Natural Resources Agency Urban Greening Grant Program:** Consistent with AB 32, the Urban Greening Program will fund projects that reduce greenhouse gases. This program includes urban heat island mitigation projects and energy conservation efforts related to shade tree projects.
- **Cal Fire:** Through the California Climate Investments (CCI) Urban & Community Forestry Grant Program, CALFIRE works to optimize the benefits of trees and related vegetation through multiple-objective projects as specified in the California Urban Forestry Act of 1978.
- **Active Transportation Program (ATP): California Department of Transportation (CALTRANS):** Urban forestry, such as trees and other vegetation, are significant components of several eligible projects under the ATP, including parks, trails, and safe-routes-to-schools.
- **California Urban Forests Council (CAUFC):** As a coalition, CAUFC is dedicated to the expansion and perpetuation of sustainable urban and community forests to enhance the quality of life for all Californians.

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

Due to the community's interest in increased urban greening, the District will be working with other agency partners to bring increased funding for urban greening to the AB 617 selected communities, as further described in the following measure.

MEASURE 3.A URBAN GREENING

Overview: The purpose of this strategy is to identify and support efforts to increase urban greening to improve air quality for residents in the Arvin and Lamont communities. This measure is supported by scientific studies that have shown urban trees can help with the removal of air pollutants and reduced emissions of volatile organic compounds (VOC's). The effects of urban trees on fine particulate matter (PM_{2.5}) was modeled for ten U.S. cities, with total annual PM_{2.5} removal varying from 5.2 tons in Syracuse to 71.1 tons in Atlanta. Overall air quality improvements attributed to urban trees ranged between 0.05% in San Francisco to 0.24% in Atlanta (Nowak, Hirabayashi, Bodine, Hoehn, 2013). Based on a study to assess the effects of urban trees on air quality have found that urban vegetation can attribute to temperature reduction, removal of air pollutants, reduced emission of VOCs, and building energy conservation (United States Department of Agriculture Forest Service, 2002). The measure would also include an ongoing maintenance program with the landowner or land use agency where the trees are planted.

The District has long been supportive of the public benefits provided from planting of trees and vegetation. The District's Fast Track Action Plan, adopted by the Governing Board to reduce ozone pollution in the Valley, identified strategic use of tree and vegetation planting as a potential measure to reduce ozone. There has also been significant efforts at the federal, state, and local levels to promote and increase urban greening through funding opportunities, programs, and projects.

It should be noted that, while the District has no direct authority over how agencies allow land, under their jurisdiction, to be used. These land-use decisions on whether to allow or require urban greening in specific locations, are the responsibility, under state law, of cities and counties, school Districts, private landowners, or state & federal agencies responsible for transportation corridors, state and federal parks, and other properties. While AB 617 does not provide the District with new land-use regulatory authority, so land-use authority continues to remain with cities, counties, and state and federal land-use agencies, as discussed in CARB's Blueprint (see "Who Has the Authority to Implement Actions?", page 26 of the Blueprint), the District is committed to working with these agencies and the CSC to see this measure implemented this measure.

Implementing Agency: Valley Air District, City of Arvin, Kern County, and other local partners as identified by the CSC

Type of Measure: Partnership, Incentives

Budgeted Amount: \$500,000

Quantifiable emission reduction: Utilize CARB-established methodology available through the Urban & Community Forestry Program

VEGETATIVE BARRIERS

Vegetative barriers, also known as windbreaks, are comprised of one or more rows of trees or shrubs that may be planted in specific areas of concern in order to improve air quality in the immediate area by intercepting airborne particles, dust, chemicals, and odors. Pollutants directly emitted from cars, trucks, and other motor vehicles are found in higher concentrations near major roads. In addition, stationary sources such as industrial facilities, factories, and other industrial processes can also contribute air pollutants to their surrounding areas. While various emission control techniques and programs exist to reduce these pollutants from mobile and stationary sources, vegetative barriers have been shown to be an additional measure to potentially reduce a population's exposure to air pollution through the interception of airborne particles and the uptake of gaseous pollutants. Examples of vegetative barriers include trees, bushes, shrubs, or a mix of these. Generally, a higher and thicker vegetative barrier with full coverage will result in greater reductions in downwind pollutant concentrations. In addition to air quality benefits, vegetative barriers can improve aesthetics, increase property values, reduce heat, control surface water runoff, and reduce noise pollution.⁶

Characteristics of a vegetative barrier that should be considered include the porosity/density of the vegetative barrier, the characteristics of the vegetation during different seasons, leaf surface characteristics, vegetation air emissions (e.g. biogenic VOCs), and the resistance of the vegetative barrier to air pollution. Other considerations include: soil characteristics, availability of water, control of water runoff, maintenance of the vegetative barrier, use of native and non-invasive species, and roadway safety. Vegetative barriers may also be used with solid barriers to increase mitigation. Research is ongoing as to the effectiveness of vegetative barriers in reducing exposure to pollutants, but a recent study has found that vegetative barrier installations may reduce downwind exposure to carbon monoxide and fine particulate matter by at least 23%.⁷

The US EPA has produced a fact sheet with further information on vegetative barriers, available here: https://19january2017snapshot.epa.gov/sites/production/files/2016-08/documents/recommendations_for_constructing_roadside_vegetation_barriers_to_improve_near-road_air_quality.pdf

⁶ Baldauf, R. (2016). Recommendations for Constructing Roadside Vegetation Barriers to Improve Near-Road Air Quality. National Risk Management Laboratory Office of Research and Development, Air Pollution Prevention and Control Division: Washington, DC, USA.

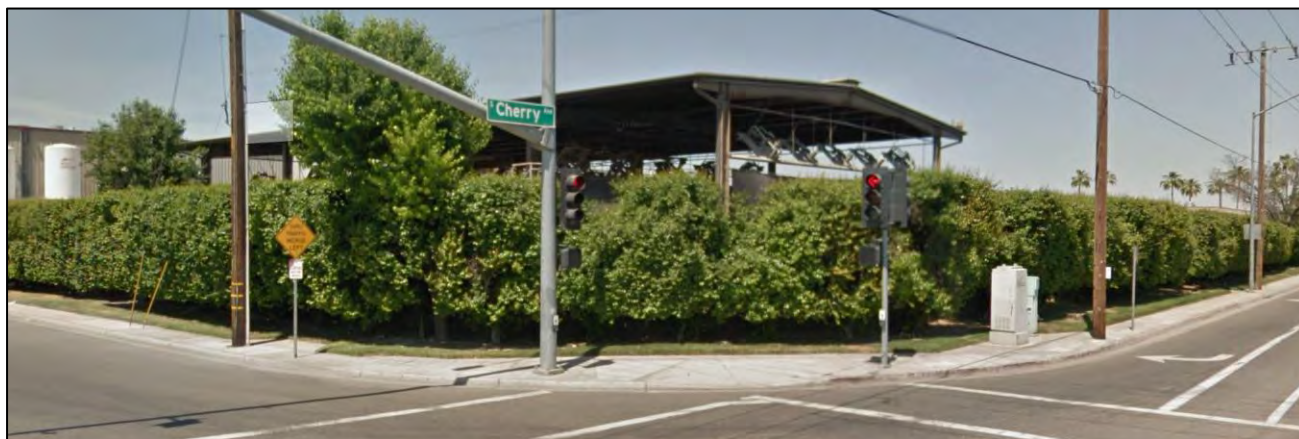
⁷ Lin, M. Y., Hagler, G., Baldauf, R., Isakov, V., Lin, H. Y., & Khlystov, A. (2016). The effects of vegetation barriers on near-road ultrafine particle number and carbon

Figure 4-8 Vegetative Barrier w/ Solid Barrier on Highway 198, Visalia, CA



Latest Google Map Information

Figure 4-9 Vegetative Barrier around Foster Farms, Fresno, CA



Latest Google Map Information

COMMUNITY CONCERNS AND COMMENTS

The Arvin/Lamont Steering Committee has identified Vegetative Barriers as a priority for air pollutant mitigation. The committee has expressed the need for the installation of vegetative barriers around sources of concern and sensitive receptors, such as schools or along major truck traffic corridors.

CURRENT PROGRAMS

The Valley Air District, the City of Arvin, Kern County, the California Department of Transportation (Caltrans), and other local partners have promoted the use of vegetative barriers for reducing exposure to air pollutants, mitigating the urban heat island effect, and improving aesthetics.

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

Based on community interest in vegetative barriers, the following measure was developed for implementation as a part of the Arvin/Lamont CERP.

MEASURE 3.B INSTALLATION OF VEGETATIVE BARRIERS AROUND SOURCES OF COMMUNITY CONCERN

Overview: The purpose of this strategy is to provide incentives for the installation and maintenance of vegetative barriers around sources of concern to reduce particulate matter, odor, and other emissions, as feasible. Based on community interest in vegetative barriers, the District will also look to partner with other agencies to identify additional grant funding to support the installation of vegetative barriers at/near industrial facilities, schools, and along major transportation corridors.

It should be noted that the SJVAPCD has no authority over how agencies allow land under their jurisdiction to be used. These land-use decisions, such as whether to allow or require vegetative barriers in specific locations, are historically the responsibility, under state law, of cities and counties, or, in some cases, state and federal agencies responsible for transportation corridors, state and federal parks, and other properties. AB 617 does not provide the District with new land-use regulatory authority, so land-use authority remains with cities, counties, and state and federal land-use agencies, as discussed in CARB's Blueprint (see "Who Has the Authority to Implement Actions?", page 26 of the Blueprint), the District is committed to working with these agencies and the CSC to see this measure implemented.

Implementing Agency: Valley Air District, City of Arvin, Kern County, other local partners as identified by the CSC

Type of Measure: Partnership, Incentives

Implementation: 2022-2025

Budgeted Amount: \$500,000

Quantifiable emission reduction: Estimated 5-year emissions reductions associated with this measure includes up to 0.3 tons combined of PM2.5 and NO2 per year.

**MEASURE 3.C FUNDING FOR ROAD IMPROVEMENTS, SIDEWALK
INSTALLATION, AND BIKE PATHS**

Overview: The purpose of this measure is to assess current roads, sidewalks and bike path infrastructure needs; to support community identified priority projects; and to seek out additional funding opportunities to make the community more bike and walk friendly.

Reducing emissions from motor vehicles through the implementation of alternate modes of transportation, including walking and bicycling, is important to reduce the public's exposure to vehicle emissions including NOx and PM2.5. This strategy would provide incentive funding for the development and construction of road and sidewalk improvements as well as Class 1, Class 2, and Class 3 bicycle paths, lane striping, and routes. The proposed funding level of this measure would be beyond the established District guidelines from the District's REMOVE and Public Benefit Grants Programs. Additionally, the District will work with transportation agencies in the Arvin/Lamont area, and seek to assist these agencies to identify project priorities and leverage existing funds, in addition to AB 617 funding, to maximize the number of projects that can be completed.

Implementing Agencies: Valley Air District, City of Arvin/Lamont, Kern County, and Kern Council of Governments

Type of Measure: Incentives

Budgeted Amount: \$12,000,000

Quantifiable Emission Reductions: Estimated lifetime emissions reductions associated with this measure includes up to 10.2 tons of PM, 18.6 tons of NOx, and 37.8 tons of VOC.

MEASURE 3.D PUBLIC FLEET VEHICLES

Overview: To provide increased outreach and access to incentive funding for the replacement of older, higher polluting public fleet vehicles operating within the Arvin/Lamont community with new clean vehicle technology.

Replacing older public fleet vehicles is important to reduce the public's exposure to vehicle emissions including NOx and PM2.5. These pollutants negatively affect human health, especially for sensitive populations such as children. These are new clean vehicle technologies, including plug-in hybrid, battery electric and natural gas that are significantly cleaner than conventionally-powered gasoline and diesel vehicles.

State and Federal requirements control emissions from passenger vehicles. The Valley Air District does not have jurisdiction over these sources. However, due to the large amount of air pollution that originates from passenger vehicles in the Valley, including public fleet vehicles, the District has implemented a suite of programs to reduce pollution from public fleets:

- The Public Benefit Grants Program - <http://valleyair.org/grants/publicbenefit.htm>. The District operates this program. The purpose of this program is to fund the purchase of new electric, plug-in hybrid, or alternative fuel vehicles for public agencies to promote clean air alternative-fuel technologies and the use of low-or zero-emission vehicles in public fleets. This program is currently open and accepting applications on a first-come-first-served basis.
- Employer Based Trip Reduction (District Rule 9410) requires large employers to implement measures to encourage employees to take alternative transportation to work through the establishment of an Employer Trip Reduction Implementation Plan (eTRIP).
 - An eTRIP is a set of measures that encourages employees to use alternative transportation and ridesharing for their morning and evening commutes.
 - Each measure contributes to a workplace where it is easier for employees to choose to use ridesharing or alternative transportation.
 - Through this rule, single-occupancy vehicle trips are reduced, thus reducing emissions of oxides of nitrogen (NOx), volatile organic compounds (VOC) and particulate matter (PM).

The goal of this action is to work closely with public agencies, including City of Arvin and Kern County, to expedite the replacement of up to 20 vehicles through the District's Public Benefit Grants Program. This includes increased outreach to public agencies operating vehicles within the community as well as prioritized funding for

projects in the community.

Implementing Agencies: Valley Air District, City of Arvin/Lamont, Kern County, and Kern Council of Governments

Type of Measure: Incentives

Budgeted Amount: \$400,000

Quantifiable Reductions: Estimated lifetime emissions reductions associated with this measure includes up to 0.1 tons of PM

MEASURE 3.E PARTNERSHIP TO CONNECT RESIDENTS TO INCENTIVES FOR EBIKES

Overview: The goal of this strategy is to encourage adoption for low-income individuals of electric bicycles (e-bikes) as a replacement for motor vehicle trips. The strategy would increase access to clean transportation options while reducing vehicles miles traveled by incentivizing e-bikes for the Arvin/Lamont community. Emission reductions from the utilization clean transportation provides benefits to area residents as well as assist in reducing impact from pollution in the Arvin/Lamont community.

Through the California Air Resources Board new e-bike voucher program, launching in July 2022, qualified residents would be eligible for an incentive to purchase an e-bike. The strategy will increase outreach and access to the statewide incentive funding towards the purchase on an eligible e-bike for low-income residents. The District will work with CARB and community residents to bring awareness about the e-bike program to the community.

Implementing Agency: California Air Resources Board and Valley Air District

Type of Measure: Outreach

Quantifiable Emission Reductions: Estimated emissions reductions associated with this measure will be calculated with CARB-approved methodology.

4.4. REGULATIONS AND ENFORCEMENT

Due to the nonattainment status of the Valley Air Basin for the criteria pollutants of fine particulate matter and ozone, the District requires that permitted facilities implement the most stringent control measures feasible for implementation to control criteria pollutants and associated precursor emissions. Beyond the regulations and stringent permitting requirements that are already implemented Valley-wide, the following sections detail enhanced regulatory strategies that will be implemented in the AB 617-selected community.

STATIONARY SOURCES IN ARVIN/LAMONT

A variety of stationary sources located in and around the Arvin/Lamont Community contribute to the overall emissions profile of the community. These sources range from smaller operations like gasoline dispensing operations (GDOs) and auto body coating operations, to larger operations like agricultural and oil and gas operations.

Oil and gas operations include equipment like internal combustion (IC) engines, boilers/steam generators, flares, and many others. Criteria pollutant emissions from this source category include NO_x, SO_x, PM₁₀/PM_{2.5}, CO, and VOC, and toxic air contaminants (TACs) like benzene, toluene, xylene, and hydrogen sulfide.

Within the Arvin/Lamont community, stationary sources contribute 55.06 tons per year (tpy) of NO_x, 46.46 tpy of VOCs, and 4.77 tpy of PM_{2.5}, which represents about 15%, 30%, and 9% of the total community inventory, respectively.

COMMUNITY CONCERNS AND COMMENTS

During committee discussions regarding stationary sources, committee members identified oil and gas production, agricultural operations, and waste disposal as some of the sources to address. Members shared suggestions such as vegetative barriers at schools, highways, and agricultural fields, as well as providing incentives for resident vehicle repair, enhanced enforcement of dust regulations, replacement of diesel trucks and old tractors, and educational resources available for the community on District incentive programs and air quality information, among others.

CURRENT CONTROL PROGRAMS

For more than 25 years, the District has implemented several generations of emissions control regulations for stationary and area sources under its regulatory jurisdiction. These control measures represent the nation's toughest air pollution regulations and have greatly contributed to reducing ozone and particulate matter concentrations in the Valley. Stringent and innovative rules, such as those for indirect source review, residential wood burning, and agricultural burning, have set benchmarks for California and the nation. While there has been significant progress in reducing air pollution with these regulations, which have been greatly aided by the pollution reduction efforts and financial investments of Valley businesses and residents, the District continues to adopt and modify rules to achieve ongoing

emissions reductions and advance our progress toward clean air.

Gasoline Dispensing Operations (GDOs):

Gasoline dispensing operations in the San Joaquin Valley are primarily subject to [District Rule 4621](#) - *Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants* and [District Rule 4622](#) - *Gasoline Transfer into Motor Vehicle Fuel Tanks*.

The purpose of Rule 4621 is to limit VOC emissions from stationary storage containers, delivery vessels, and bulk plants. This rule applies to gasoline storage containers with capacities greater than 250 gallons and has requirements to install CARB certified Phase I vapor control systems. The purpose of Rule 4622 is to limit emissions of gasoline vapors from the transfer of gasoline into motor vehicle fuel tanks. This rule applies to any gasoline storage and dispensing operation or mobile fueler from which gasoline is transferred into motor vehicle fuel tanks. This rule also requires the installation of CARB certified Phase II vapor control systems. GDOs are subject to stringent enforcement provisions, including ongoing monitoring of equipment and annual inspections.

Auto Body Coating Operations:

Auto body coating operations in the San Joaquin Valley are primarily subject to [District Rule 4612](#) - *Motor Vehicle and Mobile Equipment Coating Operations* and [District Rule 4101](#) - *Visible Emissions*.

The purpose of Rule 4612 is to limit VOC emissions from coatings of motor vehicles, mobile equipment, and associated parts and components, and associated organic solvent cleaning, storage, and disposal. This rule applies to any person who supplies, sells, offers for sale, manufacturers, or distributes any automotive coating for use within the District, as well as any person who uses, applies, or solicits the use or application of any automotive coating within the District. This rule requires the sale and use of low VOC coatings and solvents, in addition to stringent requirements for the application of these coatings. Auto body coating operations are subject to stringent enforcement provisions, including ongoing recordkeeping of coatings/solvents used and annual inspections. Auto body coating operations must demonstrate continued compliance with additional visible emissions requirements as described in Rule 4101.

Oil and Gas Operations:

Oil and gas operations in the San Joaquin Valley are primarily subject to the following District rules:

- [Rule 2260](#) – Registration Requirements for Equipment Subject to California's Oil and Gas Regulation
- [Rule 4311](#) – Flares
- [Rule 4401](#) – Steam-Enhanced Crude Oil Production Wells
- [Rule 4402](#) – Crude Oil Production Sumps
- [Rule 4404](#) – Heavy Oil Test Station - Kern County

- [Rule 4407](#) – *In-Situ Combustion Well Vents*
- [Rule 4408](#) – *Glycol Dehydration Systems*
- [Rule 4409](#) – Components at Light Crude Oil Production Facilities, Natural Gas Processing Facilities, and Natural Gas Processing Facilities
- [Rule 4453](#) – *Refinery Vacuum Producing Devices or Systems*
- [Rule 4454](#) – *Refinery Process Unit Turnaround*
- [Rule 4455](#) – Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants
- [Rule 4460](#) – *Petroleum Refinery Fence-Line Air Monitoring*
- [Rule 4623](#) – *Storage of Organic Liquids*
- [Rule 4624](#) – *Transfer of Organic Liquid*

Depending on the equipment used by the oil and gas operation, units like boilers, steam generators or IC engines would be subject to:

- Rules [4306](#) and [4320](#) – *Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr*
- [Rule 4702](#) – *Internal Combustion Engines*

The purpose of **Rule 2260** is to provide a registration process that satisfies the requirements of California's Oil and Gas Regulation, which limits methane emissions and leaks from equipment used in the oil and gas industry.

The purpose of **Rule 4311** is to establish flaring requirements and reduce VOC, NO_x, and SO_x emissions from operations involving the use of flares.

The purpose of **Rule 4401** is to limit VOC emissions from steam-enhanced crude oil production wells and related piping.

The purpose of **Rule 4402** is to limit VOC emissions from sumps used to store crude oil and produced water in crude oil production operations.

The purpose of **Rule 4404** is to limit VOC emissions from the operation of heavy oil test stations, i.e. a tank setting used to measure and collect crude oil from individual wells.

The purpose of **Rule 4407** is to limit VOC emissions from in-situ combustion wells and related piping. This process is largely no longer in use by oil production companies in the District.

The purpose of **Rule 4408** is to limit VOC emissions from glycol dehydration systems, a process in which water vapor is removed from produced gas streams.

The purpose of **Rule 4409** is to limit VOC emissions from leaking components at light crude oil production facilities, natural gas production facilities, and natural gas processing facilities.

The purpose of **Rule 4453** is to limit VOC emissions from refinery vacuum producing devices or systems by requiring that gasses from these systems be collected and controlled.

The purpose of **Rule 4454** is to limit VOC emissions resulting from the purging, repair, cleaning, or otherwise opening or releasing pressure from a refinery vessel during a process unit turnaround, i.e. taking equipment out of service for maintenance.

The purpose of **Rule 4455** is to limit VOC emissions from leaking components at petroleum refineries, gas liquids process facilities, and chemical plants.

The purpose of **Rule 4460** is to require real-time fence-line air monitor systems at or near property boundaries of petroleum refineries, which will provide air quality information to the public regarding concentrations of various air pollutants.

The purpose of **Rule 4623** is to limit VOC emissions the storage of organic liquids, including crude oil.

The purpose of **Rule 4624** is to limit VOC emissions from the transfer of organic liquids. Oil and gas facilities are subject to stringent enforcement provisions, including inspection and maintenance (I&M) programs, periodic source testing requirements, and annual inspections. These operations are also subject to stringent emission control and leak detection and repair requirements.

The purpose of **Rules 4306 and 4320** is to limit emissions of NO_x, CO, oxides of sulfur (SO₂), and PM₁₀ from boilers, steam generators, and process heaters. These rules apply to any gaseous fuel or liquid fuel fired boiler, steam generator, or process heater with a total rated heat input greater than 5 million Btu per hour. These rules have very stringent emission limits, periodic monitoring, and source testing requirements.

The purpose of **Rule 4702** is to limit the emissions of NO_x, CO, VOC, and SO_x from internal combustion engines. This rule applies to any internal combustion engine rated at 25 brake horsepower or greater. This rule has very stringent emission limits, periodic monitoring, and source testing requirements.

Waste Disposal– Landfill and Composting Operations:

Waste disposal operations in the San Joaquin Valley are primarily subject to the following District rules:

- [Rule 4311](#) – *Flares*
- [Rule 4565](#) – *Biosolids, Animal Manure, and Poultry Litter Operations*
- [Rule 4566](#) – *Organic Material Composting Operations*
- [Rule 4642](#) – *Solid Waste Disposal Sites*
- Rules [8011](#) through [8071](#) – *Fugitive PM₁₀ Emissions*

The purpose of **Rule 4311** is to establish flaring requirements and reduce VOC, NO_x, and SO_x emissions from operations involving the use of flares.

The purpose of **Rule 4565** is to limit emissions of VOCs from operations involving management of biosolids, animal manure, or poultry litter.

The purpose of **Rule 4566** is to limit VOC emissions from composting operations.

The purpose of **Rule 4642** is to reduce VOC emissions from solid waste disposal sites, which have a gas collection system and/or control device in operation, or undergoing maintenance or repair.

The purpose of **Rules 8011 through 8071** is to reduce fugitive dust emissions from outdoor sources such as agricultural operations, construction sites, bulk material handling and/or transporting operations, or other earth moving activities.

Agricultural Operations:

Agricultural operations in the San Joaquin Valley are primarily subject to the following District rules:

- [Rule 4102](#) – *Nuisance*
- [Rule 4550](#) – *Conservation Management Practices*
- [Rule 4570](#) – *Confined Animal Facilities*
- Rules [8011](#) through [8071](#) – *Fugitive PM₁₀ Emissions*

Depending on the equipment used by the agricultural operation, units like boilers, steam generators or IC engines would be subject to the following rules as described previously:

- Rules [4306](#) and [4320](#) – *Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr*
- [Rule 4702](#) – *Internal Combustion Engines*

The purpose of **Rule 4102** is to protect the health and safety of the public prohibiting a person to discharge quantities of air contaminants or other materials which could cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such person or the public, or businesses and property.

The purpose of **Rule 4550** is to limit fugitive dust emissions from agricultural operation sites, by implementing a list of selected activities related to land preparation, harvesting, handling and raising of animals, and the use of agricultural unpaved roads, and unpaved vehicle/equipment traffic areas, among others.

The purpose of **Rule 4570** is to limit emissions of VOC from confined animal facilities, where animals are corralled, penned, or otherwise caused to remain in restricted areas for commercial purposes.

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

Due to the priority that community members placed on reducing PM2.5 and toxic air contaminant emissions that originate from stationary sources in and around the community, the following strategies have been developed for implementation in the Arvin/Lamont community.

MEASURE 4.A ENHANCED INSPECTION FREQUENCY

Overview: The goal of this strategy is to limit the potential for localized air quality impacts at permitted facilities that have had emissions violations in the last three years.

The District conducts inspections and investigations of permitted sources to determine compliance with a multitude of health-protective local, state, and federal air quality regulations that target both criteria and toxic pollutants. The District closely monitors these sources and strictly enforces applicable requirements. Compliance inspections are unannounced whenever possible and involve both a physical inspection of the facility and a review of their records. When a violation of a District permit, rule, or regulation is identified, the District takes appropriate enforcement action.

The District reviewed the enforcement history over a three-year period (October 2018-October 2021) for the permitted facilities in the Arvin-Lamont community, and determined that 72 enforcement actions were issued to facilities (not including gas stations) for violations resulting in excess emissions. These violations occurred at 9 permitted facilities in the Arvin/Lamont area. The District also issued 20 enforcement actions at 12 gas stations in the Arvin-Lamont community for violations resulting in excess emissions. The District believes that more frequent inspections for 20 of these 21 facilities, when feasible, would help to limit the potential for air quality impacts associated with emissions violations.

The District will increase the frequency of inspection at these facilities within the Arvin/Lamont community that has had an emission-based violation over the past three (3) years. These facilities will be inspected at least twice per calendar year for the next five (5) years or until the facility has four (4) consecutive inspections without an emissions violation, whichever occurs first.

Implementing Agency: Valley Air District

Type of Measure: Enforcement

Quantifiable Emission Reductions: Reduction in excess PM_{2.5}, PM₁₀, NO_x, SO_x, VOC, and CO emissions through higher compliance rates

MEASURE 4.B STATIONARY SOURCE RULEMAKING

Overview: The District will be analyzing District Rules to pursue additional emission reduction opportunities and implementing recently adopted District Rules throughout the CERP implementation period.

Recent Rule Amendments Affecting Arvin/Lamont Stationary Sources:

- Rule 4702 – Internal Combustion Engines
- Rules 4306/4320 – Boilers, Steam Generators, Process Heaters
- Rule 4905 – Flares

Rule Evaluation for Further Reduction from Arvin/Lamont Stationary Sources:

- Rule 4460 – Petroleum Refinery Fence-Line Air Monitoring
- Rule 4625 – Wastewater Separators
- Rule 4621 – Gasoline Transfer into Stationary Storage Containers, Delivery Vessels, and Bulk Plants
- Rule 4402 – Crude Oil Production Sumps
- District Rules for Leak Detection and Repair (LDAR) rules for oil and gas industrial processes:
 - Rule 4623 – Organic Liquid Storage
 - Rule 4624 – Transfer of Organic Liquids
 - Rule 4401 – Steam Enhanced Wells
 - Rule 4409 – Light Oil/Gas Plants Rule 4455 – Petroleum Refineries, Gas Processing Facilities, and Chemical Plants

Emissions reductions achieved through the implementation of more stringent limits potentially required through these rule amendments will further contribute to reduced exposure to air pollution in the community. Community Steering Committee members, members of the AB 617-selected community, and the general public will regularly receive notice from the District on opportunities to be involved in the upcoming rulemaking process for these rules. In addition, the District will publish monthly status updates to the Arvin/Lamont community-specific website.

Implementing Agency: Valley Air District

Measure Type: Regulatory

Quantifiable Emission Reductions: Potential reductions through the implementation of additional regulatory requirements as feasible.

MEASURE 4.C EXPEDITED AB 2588 ASSESSMENT

Overview: This strategy will expedite the review of stationary sources of pollution in the community that are currently being reassessed under the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588).

Under AB 2588, all facilities located within the boundaries of the District are required to report toxic substances released into the air by their operation to the District. The District's responsibilities under the state's Air Toxics "Hot Spots" program are to:

- Identify Valley facilities that release toxic air contaminants as a result of their day to day operations,
- Collect and quantify emission data from equipment located at permitted facilities
- Identify facilities causing localized health impacts on nearby residents,
- Determine facility-wide health risks resulting from the emission of toxic air contaminants,
- Notify nearby residents and businesses of significant risk facilities in their vicinity, and
- Require that significant risk facilities reduce their risks to a level that no longer constitutes a significant risk to nearby residences and businesses.

The District's implementation of AB 2588, California's Air Toxics "Hot Spots" Information and Assessment Act, has resulted in major reductions in emissions of air toxics from existing sources in the San Joaquin Valley. Under this right-to-know law, the District has worked with Valley facilities to quantify emissions of air toxics, determine the health risk caused by those emissions, report emissions and any significant risks through written public reports and neighborhood public meetings, and take steps to reduce such risks.

This measure will result in the expedited AB 2588 reviews for facilities located within the Arvin/Lamont Community. More information about this effort can be found later in the section, "Additional Regulatory Measures to Reduce Emissions in the Community." Please refer to Appendix E for additional details about the District's Health Risk Assessment Process, and a table identifying the AB 2588 reassessment status of each facility within the community.

Implementing Agency: Valley Air District

Measure Type: Regulatory

Quantifiable Emission Reductions: Ongoing review of air toxics risk and mitigation under AB 2588 program.

SOURCES OF DUST IN THE COMMUNITY

BACKGROUND

In the Arvin/Lamont community, sources of dust emissions include unpaved roads and traffic areas, construction, open areas, and other earthmoving activities. Construction, demolition and other earthmoving activities emit less than 1 ton per year of PM_{2.5} in the community, paved and unpaved road dust emits 9.9 tons per year of PM_{2.5}, and dust from open areas contributes 5.3 tons of PM_{2.5}.

COMMUNITY CONCERNS AND COMMENTS

The Community Steering Committee expressed an interest in evaluating air quality impacts and felt it important to look to reduce road dust and other sources of dust in the community.

CURRENT CONTROL PROGRAMS

Regulation VIII (Fugitive PM₁₀ Prohibition) / Dust Control Plan (DCP): The District's Regulation VIII series (Fugitive PM₁₀ Prohibitions) was adopted in November 2001, and subsequently amended in 2004. This rule series contains a comprehensive suite of rules designed to reduce fugitive PM₁₀ emissions from a range of sources including:

- Specified outdoor fugitive dust sources.
- Construction or demolition related disturbances of soil, including land clearing, grubbing, scraping, excavation, extraction, land leveling, grading, cut and fill operations, travel on the site, travel access roads to and from the site, and demolition activities.
- Outside storage and handling of any unpackaged material, which emits or has the potential to emit dust when stored or handled.
- Prevention and cleanup of mud and dirt whenever it is deposited (carryout and trackout) onto public paved roads
- Open areas 0.5 acres or more within urban areas, or 3.0 acres or more within rural areas that contain at least 1,000 square feet of disturbed surface area.
- Any paved, unpaved, or modified public or private road, street highway, freeway, alleyway, access drive, access easement, or driveway.
- Unpaved vehicle/equipment areas, including parking, fueling, service, shipping, receiving, and transfer areas.
- "Off-field" agricultural sources including, but not limited to, unpaved roads, unpaved vehicle/equipment traffic areas, and bulk materials.

Additionally, the Regulation VIII rules are implemented via the District's Dust Control Plan (DCP) program:

https://www.valleyair.org/busind/comply/PM10/compliance_PM10.htm

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

Due to the priority that the Steering Committee placed on reducing dust in the community, a specific strategy has been developed to target emission reductions from

fugitive dust sources. The District is proposing enhanced enforcement of Regulation VIII rules to reduce fugitive dust from construction and earthmoving activities within the community. The District is also committed to working with Kern County, the City of Arvin, and other agency partners to address paved and unpaved road dust.

MEASURE 4.D FUGITIVE DUST ENFORCEMENT

Overview: The goal of this strategy is to limit the potential for localized air quality impacts associated with fugitive dust from construction/earthmoving activities and open areas subject to District Regulation VIII.

District rules limit fugitive dust emissions from construction, demolition, and earthmoving; bulk material storage; open areas; and unpaved roads and vehicle/equipment traffic areas. Furthermore, District rules restrict carryout and trackout of dirt and dust onto paved public roadways. Regulation VIII does not limit emissions from vehicles used in these projects.

Regulation VIII requires, a Construction Notification or Dust Control Plan for all construction activities in the District involving one or more acre of disturbed surface area. District staff reviews each Construction Notification and Dust Control Plan prior to the start of construction, to ensure that operators have committed to utilize required and effective work practices and mitigation measures to reduce fugitive dust emissions to within rule limitations. Additionally, District staff surveys and inspects these construction activities, responds to public complaints regarding fugitive dust, and provides training classes for those required to submit Dust Control Plans.

In reviewing the compliance history for the Arvin/Lamont community, it was determined that the District had received 13 complaints regarding fugitive dust related issues over the last 3 years, with the majority pertaining to truck traffic activities and open areas. Building on the District's existing inspection and complaint response efforts, the District will conduct at least one targeted enforcement effort within the Arvin/Lamont community during both the 2nd and 3rd quarters for the next five (5) years.

This fugitive dust reduction enforcement strategy is being included in the CERP in response concerns raised by CSC members regarding fugitive dust emissions in the community.

Implementing Agency: Valley Air District

Type of Action: Enforcement

MEASURE 4.E HEAVY-DUTY IDLING ENFORCEMENT

Overview: The goal of this strategy is to limit the potential for localized emissions from heavy-duty vehicles for failure to comply with the state's heavy-duty anti-idling regulation. Historically, the District has partnered with CARB to conduct anti-idling enforcement throughout valley communities.

The state's anti-idling Airborne Toxic Control Measure limits nonessential (or unnecessary) vehicle idling to specific time limits. It is applicable to all diesel-fueled commercial motor vehicles with gross vehicular weight ratings of greater than 10,000 pounds. The diesel exhaust from excessive idling has the potential to impose significant adverse health and environmental impacts. Therefore, efforts to ensure compliance with the anti-idling regulation, especially near schools and residential areas, are important to reduce the potential for localized impacts within the community.

The District will partner with CARB to conduct additional targeted anti-idling enforcement efforts in the Arvin/Lamont community with established benchmarks. These benchmarks include anti-idling surveillance, to occur at least once per quarter, for the next 5 years. The District and CARB will work with the Community Steering Committee to identify heavy-duty vehicle idling "hot spots," especially those near schools, to aid in focusing the enforcement efforts.

Implementing Agency: Valley Air District and CARB

Type of Measure: Enforcement

Quantifiable Emission Reductions: Reduction in PM_{2.5}, PM₁₀, NO_x, VOC, and CO emissions through higher compliance rates with the state regulation.

4.5. AGENCY PARTNERSHIPS

PESTICIDES IN THE ARVIN/LAMONT COMMUNITY

The Department of Pesticide Regulation (DPR) regulates pesticides under a comprehensive program that encompasses enforcement of pesticide use in agricultural and urban environments. DPR oversees a multi-tiered enforcement infrastructure and is vested by the EPA with primary responsibility to enforce federal pesticide laws in California. In addition, they oversee the process by which pesticides are evaluated and tested before being registered and allowed to be sold and used in the State. DPR directs and oversees County Agricultural Commissioner enforcement of pesticide and environmental laws and regulations locally, including enforcement for the Department of Consumer Affairs' Structural Pest Control Board. DPR requires farmers to notify the County Agricultural Commissioner before they apply restricted material pesticides. They also require applicators to report the use of all pesticides to the County Agricultural Commissioner subsequent to their use. Additionally, agricultural operators are subject to strict rules that limit overspray and drift from the approved site of application, and may be subject to fines for violations. Schools that are located near fields where pesticides are applied are required to be provided with annual notification by the grower of all pesticides that might be used on those sites each year.

MEASURE 5.A REDUCING EXPOSURE TO PESTICIDES IN THE COMMUNITY

Overview: The Arvin/Lamont Community Steering Committee recommended several measures for CERP implementation related to pesticide application and exposure reduction, including expanded monitoring, local notification, notification opportunities through local schools, and mitigation practices such as application buffers within the community.

All pesticide-related emission reduction strategy suggestions submitted by the CSC were shared by the District with the California Department of Pesticide Regulation (DPR), Kern County, the Office of Environmental Health Hazard Assessment (OEHHA), and the California Air Resources Board (CARB). DPR, CARB, and OEHHA have committed to implement the following specific measures to reduce community exposure to pesticides:

Commitment	Action(s)	Responsible Entity
Work with the Kern County Agricultural Commissioner & the CSC to identify pesticide use & agricultural practices common to the community	- Identify pesticides used in Arvin/Lamont - Communicate to CSC the frequency, amount, and ingredients of pesticide use in community	DPR
Assist in the identification of pesticides of concern by the CSC & provide technical expertise to aid the CSC in prioritizing pesticide monitoring	- Develop a screening approach for agricultural pesticides commonly used in community - Support prioritization of pesticides for potential air monitoring based on screening criteria and other relevant information	OEHHA
Provide technical support to the CSC and Air District regarding pesticide monitoring	- Plan and conduct field monitoring activities - Provide laboratory analysis of pesticide samples (in-house or contracted lab)	CARB
	- Evaluate potential community health risks/impacts based on air monitoring results and other relevant information - Support data analysis and interpretation	DPR & OEHHA
Engage with the CSC and the community on ongoing statewide regulatory development efforts	Provide opportunities for public engagement & feedback on regulatory development for mitigation projects	DPR
Engage with the CSC and the community on ongoing statewide pesticide notification development efforts	- Regular updates to CSC on the temporary pilot notification efforts - Regular updates to CSC on timeline for notification in Kern County through statewide regulation - Provide opportunities for public engagement & feedback on regulatory development	DPR
Engage with the CSC and the community on ongoing Sustainable Pest Management	- Regular updates to the CSC on the recommendations from the workgroup - Provide opportunities for engagement in the workgroup and development of recommendations - Provide education on the benefits of sustainable pest management	DPR

Commitment	Action(s)	Responsible Entity
Engage with the CSC and the Community on enforcement procedures including complaints	• Provide clear steps and processes on how to report illegal application of pesticides • Provide updates to the CSC on violation reports • Provide education of processes on how DPR handles illegal application of pesticides • Provide engagement opportunities the CSC to provide recommendations on how to improve current enforcement mechanisms	DPR

Furthermore, Kern County will engage with CARB, DPR, the District, and the Community Steering Committee regarding expanding exposure mitigation practices in the community. Kern County will also engage with CARB, DPR, the District, and the Community Steering Committee regarding the development of a local pesticide notification system when DPR has developed a recommendation for statewide notification.

Implementing Agency: Department of Pesticide Regulation, Kern County, Office of Environmental Health Hazard Assessment, and California Air Resources Board

LAND USE IN THE COMMUNITY

Land use is the characterization of land based on what can be built on it and what the land can be used for. It is important to note that local air districts do not have authority over land use. Land use decisions are directly under the authority of Land use agencies (e.g. City and County government agencies). These agencies develop land use plans and make decisions about how they grow and expand. The design of development projects in a community significantly influences how people travel, and land use agencies typically have principal responsibility for approving development projects within their jurisdictions for a variety of land use types such as residential (single or multi-family, etc.), commercial (fast food, shopping center, retail, etc.), and industrial (warehouse distribution centers, port operations, etc.). Through the land use approval process, these agencies are responsible for implementing land use strategies that promote increased walkability, commute alternatives and cleaner transit fleets resulting in air quality benefits within a community.

Land use strategies may result in the reduction of vehicle trips by designing development to be more suitable for walking, bicycling, and transit. These land use strategies are typically outlined as measures and goals within a City or County general plan, which is the primary “long range” planning document used to locate future development and provides the framework within which decisions on how to grow, provide public services and facilities, and protect and enhance the environment are made. For information about the City of Arvin General Plan, please refer to <https://www.arvin.org/166/City-Planning>

Land use agencies’ decisions are critical in contributing to the improvement in air quality within a community and should be geared towards promoting strategies aimed at reducing vehicle miles travelled by increasing community walkability, implementing commute alternatives, and supporting infrastructure for cleaner transit fleets.

COMMUNITY CONCERNS AND COMMENTS

A primary concern expressed by Steering Committee members during meeting discussions was that heavy-duty truck exhaust, specifically attributable to truck traffic along the main highways through Arvin and Lamont, result in increased exposure to emissions for residents that live near these heavy-duty trucking corridors and major thoroughfares in the community. To address community member concerns, measures included in this section will focus both on transportation strategies that reduce exposure to mobile source emissions resulting from land use decisions.

For example, suggestions from community steering committee members included the installation of vegetative barriers to inhibit emission transport from thoroughfares into neighboring communities, support for truck rerouting studies, and supporting the replacement of older truck fleets with cleaner technologies.

As some of these suggestions relate to land use issues for which the District does not have authority, the District’s approach is to provide support for funding for zero and

near-zero heavy-duty trucks, and to support the land use planning process through the California Environmental Quality Act (CEQA). The District is supportive of measures and policies the land use agency can implement toward making the communities more transit-, bicycle-, and pedestrian-friendly, avoid land use conflicts that lead to toxics and nuisance problems, and minimizing the need to and/or mitigate air quality impacts of individual development proposals.

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN THE COMMUNITY

Several strategies have been identified under this Land Use and Transportation section that span from advocating issues, providing incentives, collaborating with the local land use agency (i.e. City of Arvin, and Kern County), to providing input through the land use process. Land use and transportation strategies developed to reduce emissions through incentives are described below.

MEASURE 5.B SUPPORT LAND USE AGENCIES

Overview: The purpose of this measure is to facilitate interagency collaboration between the City of Arvin, Kern County, and Kern Council of Governments to promote environmentally mindful alternative commute options through early discussion of related land use planning initiatives.

Mobile source emissions represent the vast majority of NOx emissions within the Arvin/Lamont Community. Reducing emissions from motor vehicles through the implementation of alternate modes of transportation directly contributes to decreasing public exposure to vehicle emissions, such as diesel particulate matter, which adversely affects human health.

Land use decisions are critical in contributing to the improvement in air quality within a community and should be geared towards promoting strategies aimed at reducing vehicle miles traveled by increasing community walkability. Examples of such strategies are listed below:

- Bicycle infrastructure
- Infrastructure to support alternative modes of transportation (electric vehicles, near-zero emissions vehicles)
- Satellite offices/telecommuting centers to reduce or eliminate employee commutes

The District will work with the CSC to ensure that the Arvin/Lamont community, which includes residents in the City of Arvin; Kern County; and the non-incorporated communities of Weedpatch, Fuller Acres, and Lamont; is notified about public engagement opportunities and updated quarterly about interagency collaboration efforts.

Implementing Agency: Valley Air District, City of Arvin, Kern County, and Kern Council of Governments

Measure Type: Land Use

Quantifiable Emission Reductions: Minimize emissions through reduced vehicle miles travel and promotion of cleaner fuels.

MEASURE 5.C HEAVY-DUTY TRUCK REROUTING

Overview: Community Steering Committee members have suggested that a study should be performed to assess the existing heavy-duty diesel truck routes that run through the communities of Arvin and Lamont. The District will work with Caltrans, Kern COG, City of Arvin, Kern County to support ongoing efforts to study truck routes along state highways in the community. The District will work with the appropriate agencies to seek additional funding, as necessary, to support this study.

Jurisdictional Issues: It should be noted that the District has no authority over how agencies allow land under their jurisdiction to be used. These land-use decisions, such as truck rerouting, are historically the responsibility, under state law, of cities and counties, or, in some cases, state and federal agencies responsible for transportation corridors, state and federal parks, and other properties. AB 617 does not provide the District with new land-use regulatory authority, so land-use authority remains with cities, counties, and state and federal land-use agencies, as discussed in CARB's Blueprint (see ["Who Has the Authority to Implement Actions?"](#), page 26 of the Blueprint). The District is committed to working with the implementing agencies to support the ongoing study and to coordinating conversations with the implementing agencies and the CSC as necessary.

Implementing Agency: City of Arvin, Kern County, Caltrans, Kern Council of Governments

Type of Measure: Partnership

Quantifiable Mitigation: Minimize exposure to diesel particulate matter emissions through potential truck routing alternatives.

MEASURE 5.D ADDRESS POTENTIAL IMPACTS FROM IDLE OIL WELLS IN COMMUNITY

Overview: Community Steering Committee members suggested that the Arvin/Lamont community should be engaged in ongoing agency efforts to address potential impacts from idle, orphaned, and abandoned oil wells in the Arvin/Lamont community. It should be noted that the District has no authority over abandoned well regulation compliance.

In response to community Concerns, the District made the request available to the responsible agency, California Geologic Energy Management (CalGEM), who provided the following commitment:

CalGEM is committed to working with the CSC and the District to identify wells within the community and to assess, prioritize, and to address any compliance issues accordingly. CalGEM has provided online tools, like WellFinder, and annual idle well reports on their website. In the near future, CalGEM and CARB will undertake a study of idle and abandon well emissions.

Implementing Agency: California Geologic Energy Management (CalGEM)

Type of Action: Partnership

4.6. OUTREACH

CURRENT OUTREACH PROGRAMS

The District's Outreach and Communications team conducts air quality outreach throughout all eight counties of the San Joaquin Valley. The District coordinates events, delivers presentations, responds to the media 24/7, manages social networks, pilots outreach campaigns like the Healthy Air Living (HAL) Schools and the winter residential "No Burn" programs, and connects with the public in multiple languages across any medium. In addition to offering media interviews, answering questions posed by the public, partnering with local institutions, and accepting speaking engagements, the District also conducts paid advertising and informational campaigns regularly to spread air quality awareness across social media, digital networks, television, radio, billboards, and other venues. Through the development of innovative tools like RAAN and the Valley Air App, almost 12,000 registered users receive automated notifications when the air quality at any location they choose to follow becomes unhealthy, allowing them to make informed decisions about their outdoor activities to limit their own exposure.

COMMUNITY CONCERNS AND COMMENTS

The Committee recommended that the District engage in a wide variety of multi-lingual outreach efforts via both traditional and social media to allow community members to see and learn about air quality issues, take advantage of grant programs, and provide real-time access to information from air monitoring equipment deployed as part of the AB 617 process. Members of the Steering Committee acknowledged the District's ongoing air quality outreach and education efforts, but expressed that effectiveness could be improved by increasing the volume and types of outreach, focusing it to a truly localized level, and using partnerships with key local organizations to better understand how to deliver needed information to the Arvin/Lamont community residents.

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

The Community Air Quality Outreach Strategies go beyond current outreach efforts to provide community-specific information about local conditions and measures the public can take to protect themselves during episodes of poor air quality through new media campaigns, workshops hosted in partnership with local civic and community organizations, and other outreach methods as identified by the community and the District.

MEASURE 6.A MULTILINGUAL OUTREACH TO INCREASE COMMUNITY AWARENESS AND KNOWLEDGE OF AIR QUALITY

Overview: The goal of this strategy is to increase community awareness of available tools to keep informed of real-time changes in air quality, clean air efforts and how communities can get involved through multi-lingual educational campaigns, videos and partner workshops. The strategy looks to focus outreach on concerns raised by the community, including building awareness on the impacts of dust pollution, traffic congestion, heavy-duty truck use and pesticide use. Additionally, the District commits to working with the CSC to educate the community and increase public understanding of what conditions create poor air quality, the health impacts of a poor air quality episode, and the availability of tools to make informed decisions about when to limit their exposure.

This strategy would aim to increase air quality understanding among residents, community members and small businesses in the Arvin/Lamont area. Concurrently, the District would aim to increase the use of available air quality tools, including the Valley Air App social media campaigns. The measure would seek to establish partnerships with local small businesses and community organizations to educate them on the tools and funding resources available to them and invite the public to workshops at these locations or other sites commonly available to the public (such as libraries, schools, and community centers) and on Zoom or other digital platforms. Both the social media outreach and live workshops would promote real-time tools such as myRAAN website, the Valley Air App, the Real-time Outdoor Activity Risk (ROAR) Guidelines, the wildfire page of the District's website, as well as information about general air quality education, wildfire smoke impacts, health effects, and similar topics. This strategy aims to increase myRAAN website registrations, Valley Air App downloads, and social media followers among members of the Arvin/Lamont community.

Annual goals for these actions include:

- Attend/host 4 community meetings, in-person or online, to share information
- 1 community targeted social media campaign

Implementing Agency: Valley Air District

Type of Measure: Outreach

Mitigation: Minimize emissions and exposure around schools.

MEASURE 6.B REDUCE ILLEGAL BURNING THROUGH RESIDENTIAL OPEN BURNING EDUCATION

Overview: The goal of this strategy is to reduce illegal burning of residential waste, such as trash, through outreach and education while focusing on areas of concern identified by the CSC. It is important to continue to educate residents of the harmful localized emissions created through the burning of residential garbage. Smoke from burning trash and yard waste contain toxic pollutants that are harmful to human health.

This strategy would include working with the City of Arvin, Kern County, and the local fire agencies to understand the illegal open burning issues within the AB 617 community. The District would then establish a series of public workshops to educate Arvin/Lamont residents about illegal open burning, to help the community better understand the health impacts of burning waste, and to address questions and concerns interactively and accessibly within a forum setting either in person or in an online platform such as Zoom. In-person workshops would take place in locations commonly available to the public such as libraries, schools, and community, health, or recreation centers when possible. Videos could be used as an outreach tool and be made available in languages such as Spanish, and others as requested.

Implementing Agency: SJVAPCD, City of Arvin, Kern County, and local fire agencies

Type of Measure: Outreach

Emission Reductions: Reduction in localized PM2.5, PM10, NOx, VOC, and CO emissions through higher compliance rates.

EXPOSURE REDUCTION STRATEGIES FOR SCHOOLS

SCHOOLS IN THE ARVIN/LAMONT COMMUNITY

The Arvin/Lamont AB 617 community contains 12 schools, primarily represented by Arvin Union School District and Lamont Elementary School District. There are also two high schools from the Kern High School District and a public charter school. Enlisting the participation and support of these schools in the effort to reduce children's exposure is key to ensuring that benefits are as widespread as possible. Targeting schools like Arvin High School, Haven Middle School and Sierra Vista Elementary, located adjacent to the city's main highway, will help protect the most vulnerable populations. All children, but especially young children, are considered sensitive receptors with respect to air pollution and it is vital that their protection from unhealthy air during their developing years is made a priority.

COMMUNITY CONCERNS AND COMMENTS

A primary concern expressed by Steering Committee members is to ensure cleaner air for children at school while fully engaging local school districts and parents in clean-air efforts. Committee members expressed a desire to use a mobile application or tool to specifically engage youth and equip them with the knowledge and understanding of how to protect themselves from poor air quality. Members were also interested in educating parents about idling risks, local pesticide risks, engaging students through social media and targeted air quality education presentations for schools in the boundary. The Steering Committee also supported incorporating an "Emissions Free Zone" model into the outreach strategies developed.

CURRENT PROGRAM

The District's Healthy Air Living (HAL) Schools program empowers participating schools to make informed decisions about outdoor activities based on real-time air quality conditions. School staff sign up for automated notifications when air quality becomes harmful using the Real-time Air Advisory Network (RAAN) tool, and receive health-protective recommendations for the modification or cancellation of outdoor activities accordingly through the Real-time Outdoor Activity Risk (ROAR) guidelines. The program includes access to resources like anti-idling signs, air quality widgets for school websites, bilingual informational materials, and bilingual educational speakers for students, parents, and staff. This program will be expanded to include an "Emissions Free Zone" model into the coordination with schools.

STRATEGIES DEVELOPED FOR IMPLEMENTATION IN COMMUNITY

Strategies developed within the community include increasing enrollment of schools in the HAL School program to protect children from exposure to unhealthy outdoor air through the widespread adoption of RAAN and ROAR and educating school staff, administration, and parents about the negative impacts of idling.

MEASURE 6.C REDUCE CHILDREN'S EXPOSURE THROUGH INCREASED ENROLLMENT IN THE HEALTHY AIR LIVING SCHOOLS PROGRAM AND THE ESTABLISHMENT OF EMISSION FREE ZONES

Overview: The goal of this measure is to reduce children's exposure to unhealthy air by increasing the participation and engagement of schools in the Healthy Air Living (HAL) Schools program. HAL Schools staff works with community schools to decrease vehicle idling, limit children's outdoor activity during episodes of poor air quality, and educate school staff, parents and students about protecting themselves from poor air quality and making decisions to reduce their personal contribution to air pollution.

Additionally, as a part of this measure, the District commits to work with school staff and students to educate the public, educators and parents regarding having an "Emission Free Zone" around schools, thereby reducing negative health impacts on student's health caused by emissions generated from vehicle idling. To help in this effort, "No Idling" signage in English and Spanish will be distributed to schools within the boundary. Additionally, informational videos will be used as an outreach tool and will be made available in languages, such as Spanish, and others on an as needed basis.

Implementing Agency: Valley Air District

Measure Type: Outreach

Mitigation: Minimize emissions and exposure around schools.

4.7. OTHER CSC-SUGGESTED ITEMS

Through the CERP development process, the CSC worked through several exercises to develop, refine, and ultimately vote to support clean air strategies to improve air quality challenges in the Arvin/Lamont Community. In this process, several measures were identified, but voted by the CSC to be excluded from the final CERP. These measures are listed below:

INCENTIVE PROGRAM FOR INSTALLATION OF ELECTRIC VEHICLE CHARGING INFRASTRUCTURE

This strategy would have allocated up to \$200,000 in incentives funding for publically accessible charging infrastructure to private and public entities in the Arvin/Lamont community.

Quantifiable Emission Reductions: Reduce emissions indirectly through transitioning to zero-emissions technology.

CSC support: 64% of the committee voted “No” to including this in the final CERP.

NEW STREET SWEEPER

This strategy would have allocated up to \$400,000 for the purchase of two new street sweepers to operate within the Arvin/Lamont AB 617 community.

Quantifiable Emission Reductions: TBD with CARB

CSC support: 85% of the committee voted “No” to including this in the final CERP.

CAR SHARING PROGRAM FOR RESIDENTS IN THE COMMUNITY

This strategy would have provided up to \$250,000 in funding for a partnering car share provider to either launch a new program in the Arvin/Lamont community and/or expand on the existing program in the Arvin/Lamont community.

Quantifiable Emission Reductions: Reduce emissions through transitioning to zero-emissions technology.

CSC support: 53% of the committee voted “No” to including this in the final CERP.

Many of the community members who voted “no” were interested in using this \$250,000 in CERP incentives funding for supporting other adopted CERP measures. The District will continue to work with the CSC to assess the funding needs of residential benefit CERP measures (e.g. **2.A** Residential Lawn/Garden, **2.C** Residential Vehicle Repair, and **2.D** Residential Vehicle Replacement) through implementation.

4.8. OVERVIEW OF CALIFORNIA AIR RESOURCES BOARD'S STATEWIDE ACTIONS

The following section was provided by the California Air Resources Board for CSC review and inclusion in the CERP:

Community-scale air pollution exposure is caused by many factors, including the cumulative impacts from multiple pollution sources. Effective solutions require multiple strategies at both the statewide and local level to deliver new emissions reductions directly within these communities.

The California Air Resources Board (CARB) has adopted a number of comprehensive air quality and climate plans over the last several years that lay out new emissions reduction strategies. These plans include the State Strategy for the State Implementation Plan,⁸ the California Sustainable Freight Action Plan,⁹ California's 2017 Climate Change Scoping Plan,¹⁰ and the Short-Lived Climate Pollutants Reduction Strategy,¹¹ the 2020 Mobile Source Strategy,¹² along with a suite of incentive programs. CARB is continuing to develop comprehensive air quality and climate plans that will further reduce emissions, including the 2022 State Strategy for the State Implementation Plan.¹³ The Community Air Protection Blueprint¹⁴ further identified additional actions to reduce the air pollution burden in heavily impacted communities throughout the State. Together, these plans provide a foundation for the new actions identified as part of this community emissions reduction program.

This section illustrates CARB's role in the community emissions reduction program, by broadly describing the regulatory and incentive-based foundational statewide actions CARB has taken to reduce emissions statewide. It also highlights specific actions that address areas of concern identified by the Arvin/Lamont community. CARB's potential enforcement strategies are described in the "CARB Enforcement" section of this CERP.

INCENTIVE PROGRAMS

CARB operates incentive programs that reduce the costs of developing, purchasing, or operating cleaner technologies. The programs help ensure cleaner cars, trucks,

⁸ California Air Resources Board, *Revised Proposed 2016 State Strategy for the State Implementation Plan*, March 7, 2017, available at: <https://ww3.arb.ca.gov/planning/sip/2016sip/rev2016statesip.pdf>.

⁹ California Department of Transportation, *California Sustainable Freight Action Plan*, July 2016, available at:

<https://dot.ca.gov/programs/transportation-planning/freight-planning/california-sustainable-freight-action-plan>.

¹⁰ California Air Resources Board, *California's 2017 Climate Change Scoping Plan*, November 2017, available at:

<https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan>.

¹¹ California Air Resources Board, *Short-Lived Climate Pollutant Reduction Strategy*, March 2017, available at:

<https://ww2.arb.ca.gov/resources/documents/slcp-strategy-final>.

¹² California Air Resources Board, *2020 Mobile Source Strategy*, October 2021, available at:

<https://ww2.arb.ca.gov/resources/documents/2020-mobile-source-strategy>.

¹³ California Air Resources Board, *2022 State Strategy for the State Implementation Plan*, available at:

<https://ww2.arb.ca.gov/resources/documents/2022-state-strategy-state-implementation-plan-2022-state-sip-strategy>.

¹⁴ California Air Resources Board, *Final Community Air Protection Blueprint for Selecting Communities, Preparing Community Emissions Reduction Programs, Identifying Statewide Strategies, and Conducting Community Air Monitoring*, October, 2018, available at: <https://ww2.arb.ca.gov/capp-blueprint>.

equipment, and facilities are operating in our neighborhoods by driving the development of new, cleaner technologies, and by accelerating their sale and adoption. Specifically, they accelerate the introduction of advanced technology vehicles and equipment, accelerate the turnover of older and higher emitting vehicles and equipment, and increase access to clean vehicles and transportation in “disadvantaged communities” and “lower-income households”, as identified and defined by California statute¹⁵.

While CARB is responsible for program oversight, some programs are implemented as a partnership with local air districts. Examples of CARB incentive programs include:

- Carl Moyer Memorial Air Quality Standards Attainment Program¹⁶
 - The AB 617, Community Air Protection Incentives¹⁷ are implemented by the air district through this program, details are below.
- Proposition 1B: Goods Movement Emission Reduction Program,¹⁸
- Funding Agricultural Replacement Measures for Emission Reductions Program,¹⁹ and
- Low Carbon Transportation Investments and Air Quality Improvement Program (which includes the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project).²⁰

Community Air Protection Incentives

Since 2017, the California Legislature has appropriated money annually from the Greenhouse Gas Reduction Fund (GGRF) for incentives to support AB 617. In advance of the first 2018 community selection, the Legislature directed CARB to focus the appropriated Fiscal Year (FY) 2017-18 CAP incentive funds in disadvantaged and low-income communities. These incentives are applied through the Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) and the Proposition 1B Goods Movement Emission Reduction Program (Proposition 1B Program) to provide immediate air quality benefits in heavily impacted communities.

Starting from FY 2017-18 the Legislature has appropriated \$704 million in CAP incentives between FYs 2017-18 and 2019-20, and an additional \$260 million in FY 2021-22 (Table 1 in Appendix A).²¹ The Legislature initially appropriated incentives to generate immediate air quality benefits in communities most likely to participate in AB 617 – primarily disadvantaged communities – as the Program began to develop. Additionally, the Board set specific priority population investment targets for the funds:

¹⁵ California Health and Safety Code § 39711.

¹⁶ For more information on the Carl Moyer Memorial Air Quality Standards Attainment Program, visit: <https://ww2.arb.ca.gov/our-work/programs/carl-moyer-memorial-air-quality-standards-attainment-program>.

¹⁷ For more information on the Community Air Protection Incentives, visit: <https://ww3.arb.ca.gov/msprog/cap/capfunds.htm>

¹⁸ For more information on the Proposition 1B: Goods Movement Emission Reduction Program, visit: <https://ww2.arb.ca.gov/our-work/programs/proposition-1b-goods-movement-emission-reduction-program>.

¹⁹ For more information on the Funding Agricultural Replacement Measures for Emission Reductions Program, visit: <https://ww2.arb.ca.gov/our-work/programs/farmer-program>.

²⁰ For more information on the Low Carbon Transportation Investments and Air Quality Improvement Program, visit: <https://ww2.arb.ca.gov/our-work/programs/low-carbon-transportation-investments-and-air-quality-improvement-program>.

²¹ California Air Resources Board, *December 2021 Report on Assembly Bill 617 CAP Incentives Appendix*, available at: https://ww2.arb.ca.gov/sites/default/files/2022-01/CAP%20Status%20Board%20Memo%20Appendix%202021-12-20_0.pdf

70 percent in and benefiting disadvantaged communities and 80 percent in and benefiting disadvantaged or low-income communities. So far, air districts have expended \$372 million in CAP incentives on projects. They expended \$303 million or 81 percent in disadvantaged communities, and \$350 million or 94 percent in disadvantaged and low-income communities.²²

Through May of 2021, air districts have expended \$372 million in CAP incentives, with \$108 million spent in AB 617 selected communities. Starting from FY 2017-18 the Legislature has appropriated \$704 million in CAP incentives between FYs 2017-18 and 2019-20, and an additional \$260 million in FY 2021-22. The CAP program recently released an updated report ([December 2021](#)).²³ The majority of the remaining \$264 million spent so far has been in other disadvantaged and low-income communities throughout the State.

To expand on initial funding options in the CAP Guidelines, CARB developed a process for the air districts to fund new projects that are responsive to community priorities and to expand stationary source incentives. CARB staff worked with the air districts and CAPCOA through late 2019 and early 2020 to ensure the process maximized flexibility to support projects asked for by community members while simultaneously meeting the need to assess emissions reductions and other benefits. Agency staff shared draft language with the public in May 2020 and incorporated their guidance as well as feedback from the air districts into the final version in October 2020²⁴.

The revised guidelines allow air districts to expeditiously develop and fund projects to reduce emissions from stationary sources and to address those concerns identified and prioritized in AB 617 community emissions reduction programs. As a criterion for CARB's approval of a Community Emissions Reduction Program, air districts must describe the level of support for the CERP and its strategies by the Community Steering Committee. Subsequent proposed project plans to implement incentive-based strategies must also document strong, widespread, and clear community support and include descriptions of community benefits, both those benefits that are quantifiable and those more qualitative in nature. The graphic below illustrates the process by which a Project Plan is developed and approved. This iterative process allows districts and CARB to account for complicated, unique, or unusual projects and ensure that they will be responsive to community needs.

²² California Air Resources Board, *2021 Report on Assembly Bill 617 Community Air Protection Incentives*, available at: https://ww2.arb.ca.gov/sites/default/files/2022-01/CAP%20Status%20Board%20Memo%202021-12-20_0.pdf

²³ California Air Resources Board, *December 2021 Report on AB 617 Community Air Protection Incentives*, available at: <https://ww2.arb.ca.gov/resources/documents/december-2021-report-ab-617-community-air-protection-incentives>.

²⁴ For more information on the 2019 Guidelines, visit: <https://ww2.arb.ca.gov/our-work/programs/community-air-protection-incentives>

Figure 4-10 Community Air Protection Project Process

The San Joaquin Valley Air Pollution Control District (APCD) created the first of these plans pursuant to the community emissions reduction program of the South-Central Fresno community, to fund a study of truck traffic within the community. The air district worked with the community to develop the Project Plan, with the intent to better understand the flow of truck traffic within South Central Fresno. The air district and the community will use the results of the study to determine whether rerouting truck traffic could reduce exposure, and to explore if and how such traffic could be rerouted effectively. CARB staff has additionally reviewed and approved other Project Plans submitted by districts such as the San Joaquin Valley APCD, the Imperial County APCD, and South Coast Air Quality Management District (AQMD). Project plans include lawn and garden equipment replacement, alternatives to open agricultural burning, replacement of nut harvesting equipment with low dust alternatives, equipment to reduce emissions from hexavalent chrome plating, road paving, urban greening, and an expanded/improved school flag program.

REGULATORY PROGRAMS

Federal, State, and local air quality agencies all work together to reduce emissions. At the federal level, the U.S. Environmental Protection Agency (U.S. EPA) has

primary authority to control emissions from certain mobile sources, including sources that are all or partly under federal jurisdiction (e.g., some farm and construction equipment, aircraft, marine vessels, locomotives), which it shares in some cases with air districts and CARB. The U.S. EPA also establishes ambient air quality standards for some air pollutants.

At the State level, CARB is responsible for controlling emissions from mobile sources and consumer products (except where federal law preempts CARB's authority), controlling toxic emissions from mobile and stationary sources, controlling greenhouse gases from mobile and stationary sources, developing fuel specifications, and coordinating State-level air quality planning strategies with other agencies.

Regionally, air districts are primarily responsible for controlling emissions from stationary and indirect sources (with the exception of consumer products in most cases) through rules and permitting programs within their regions.

CARB regulatory programs are designed to reduce emissions to protect public health, achieve air quality standards, reduce greenhouse gas emissions, and reduce exposure to toxic air contaminants. CARB establishes regulatory requirements for cleaner technologies (both zero and near-zero emissions) and their deployment into the fleet, for cleaner fuels, and to ensure in-use performance. CARB's regulatory programs are broad – impacting stationary sources, mobile sources, and multiple points within product supply chains from manufacturers to distributors, retailers, and end-users. CARB's regulations affect cars, trucks, ships, off-road equipment, consumer products, fuels, and stationary sources.

One important and relevant regulatory authority of CARB's is to adopt measures to reduce emissions of toxic air contaminants from mobile and non-mobile sources, known as Airborne Toxic Control Measures (ATCM).²⁵ These regulatory measures include process requirements, emissions limits, or technology requirements. Additionally, CARB implements the Statewide Air Toxics "Hot Spots" Program²⁶ to address the health risk from toxic air contaminants at individual facilities across the State. The Air Toxics "Hot Spots" Program includes several components to collect emissions data, identify facilities having localized impacts, ascertain health risks, notify nearby residents of significant risks, and reduce those significant risks to acceptable levels.

Under the Air Toxics "Hot Spots" Program, air districts are required to set a threshold for facilities that pose a significant health risk and prioritize facilities for health risk assessments. Air districts also establish a risk value above which facilities must conduct a risk reduction audit and emissions reduction plan. Facilities must develop these health risk assessments, risk reduction audits, and emission reduction plans.

²⁵ California Health and Safety Code § 39650 et seq.

²⁶ Assembly Bill 2588, Air Toxics "Hot Spots" Information and Assessment Act, Connelly, Statutes of 1987, California Health and Safety Code § 44300 et seq.

CARB provides technical guidance to support smaller businesses conducting health risk assessments and developing emissions reduction plans.

Additionally, CARB has pursued enforceable agreements with industry that result in voluntary but enforceable adoption of the cleanest technologies or practices and provide assurance that emissions reductions will be realized. CARB's agreement with the Union Pacific Railroad Company and BNSF Railway Company to accelerate introduction of cleaner locomotives in the South Coast Air Basin is an example of an enforceable agreement.

CARB ACTIONS RELATED TO THE ARVIN/LAMONT COMMUNITY

This section highlights CARB actions that specifically relate to the Arvin/Lamont community. This list should not be interpreted as comprehensive or exhaustive, but rather illustrative of some of the major statewide strategies driving emissions reductions in conjunction with those local level strategies identified in this community emissions reduction program. Additional CARB foundational strategies can be found in Appendix D and Appendix F of the Community Air Protection Blueprint.²⁷ The list of CARB actions and their anticipated benefits in current AB 617 communities are also available on the Program CommunityHub.²⁸

Recently Adopted CARB Regulations benefitting Arvin/Lamont

CARB adopted the Advanced Clean Trucks Rule²⁹ in June 2020 requiring truck manufacturers to transition from producing diesel trucks and vans to electric zero-emission trucks including heavy-duty vehicles beginning in 2024. Manufacturers who certify Class 2b-8 chassis or complete vehicles with combustion engines would be required to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales would need to be 55% of Class 2b – 3 truck sales, 75% of Class 4 – 8 straight truck sales, and 40% of truck tractor sales. This rule also requires that fleets report information on a one-time basis about their vehicles to support future zero-emission fleet rules.

In August 2020 CARB adopted the Heavy-Duty Engine and Vehicle Omnibus Regulation and Associated Amendments³⁰ which will require manufacturers to comply with tougher emissions standards, overhaul engine testing procedures, and further extend engine warranties to ensure that emissions of NO_x (oxides of nitrogen, a key

²⁷ California Air Resources Board, *Final Community Air Protection Blueprint for Selecting Communities, Preparing Community Emissions Reduction Programs, Identifying Statewide Strategies, and Conducting Community Air Monitoring*, October, 2018, available at: <https://ww2.arb.ca.gov/capp-blueprint>.

²⁸ Community Air Protection Program Communities: <https://ww2.arb.ca.gov/capp-communities>

²⁹ For more information on the Advanced Clean Trucks Rule, visit: <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks>.

³⁰ For more information on the Heavy-Duty Engine and Vehicle Omnibus Regulation and Associated Amendments, visit: <https://ww2.arb.ca.gov/our-work/programs/heavy-duty-low-nox>

component of smog) are reduced to help California meet federal air quality standards and critical public health goals. The regulation is expected to have a significant impact on communities adjacent to railyards, ports and warehouses that typically experience heavy truck traffic. These trucks often idle, move slowly and make frequent stops – all actions that increase NOx emissions. Today's heavy-duty trucks do not control NOx effectively during such "low load" conditions. The new standards will reduce NOx emissions by 90 percent or more when trucks are operating under these low load real-world operations. All components of the new rule will be phased in, allowing engine manufacturers time to prepare for compliance. The NOx standards that engines must meet will be cut to approximately 75 percent below current standards beginning in 2024, and 90 percent below current standards in 2027.

In December 2021 CARB approved the proposed amendments to the Small Off-Road Engine (SORE) Regulations³¹. The amended regulation will accelerate the transition of SORE equipment to zero-emission equipment (ZEE) by requiring most newly manufactured small off-road engines such as those found in leaf blowers, lawn mowers and other equipment be zero emission starting in 2024. Portable generators, including those in recreational vehicles, would be required to meet more stringent standards in 2024 and meet zero-emission standards starting in 2028. Despite their small size, these engines are highly polluting. The volume of smog-forming emissions from this type of equipment has surpassed emissions from light-duty passenger cars and is projected to be nearly twice those of passenger cars by 2031. Today, a commercial operator using one backpack leaf blower for one hour generates the same smog-forming emissions as a car driving 1,100 miles. These regulations will reduce emissions of smog-forming emissions by 72 tons per day. The amended regulation will set SORE emission standards to zero in two phases. First, for model year (MY) 2024 and all subsequent model years, emission standards will be zero. The second phase will be implemented starting in MY 2028, when the emission standards for generators and large pressure washers will be zero. Incentive funds will be available to commercial purchasers of new zero-emission equipment through CARB's Clean Off-Road Equipment Voucher Incentive Project (CORE), which was created to accelerate deployment of cleaner off-road technologies.

In December 2021 CARB approved the Heavy-Duty Inspection and Maintenance program³², which acts as a 'smog check' regulation for medium- and heavy-duty trucks and buses. While these heavy-duty vehicles with a gross vehicle weight rating (GVWR) greater than 14,000 pounds comprise only 3 percent of all vehicles on California roads, they are responsible for more than 50 percent of nitrogen oxides and fine particle diesel pollution from all mobile sources in the state. The program will cover roughly 1 million heavy-duty trucks and buses operating in California. The twice-a-year inspections will ensure that the emissions control systems maintain the same efficiency as the vehicle ages. By 2037, the program is estimated to deliver reductions of 82 tons per day of NOx and fine particle diesel pollution. The Board also directed a

³¹ For more information on the Small Off-Road Engine Regulation, visit: <https://ww2.arb.ca.gov/our-work/programs/small-off-road-engines-sore>

³² For more information on the Heavy-Duty Inspection and Maintenance Program, visit: <https://ww2.arb.ca.gov/our-work/programs/heavy-duty-inspection-and-maintenance-program>

four-times per year testing frequency for trucks with on-board diagnostics to be phased in over time. The new program is expected to yield \$75 billion in health benefits, prevent 7,500 air-quality related deaths and 6,000 hospitalizations and emergency room visits from 2023 to 2050. These benefits are 18 times the estimated cost of the program at \$4 billion.

Upcoming CARB Regulations

Advanced Clean Cars II – CARB staff is developing the Advanced Clean Cars II regulations, which will seek to reduce criteria and greenhouse gas emissions from new light- and medium-duty vehicles beyond the 2025 model year, and increase the number of zero emission vehicles for sale. For more information, visit:

<https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program>.

Advanced Clean Fleet Rules – CARB is developing a medium and heavy-duty zero-emission fleet regulation with the goal of achieving a zero-emission truck and bus California fleet by 2045 everywhere feasible and significantly earlier for certain market segments such as last mile delivery and drayage applications. For more information, visit: <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets>.

Cargo Handling Equipment Regulation Amendments – Mobile cargo handling equipment is any motorized vehicle used to handle cargo or perform routine maintenance activities at California's ports and intermodal rail yards. The type of equipment includes yard trucks (hostlers), rubber-tired gantry cranes, container handlers, forklifts, etc. The Mobile Cargo Handling Equipment (CHE) Regulation was adopted in 2005 to reduce toxic and criteria emissions to protect public health and was fully implemented by the end of 2017. CARB staff is currently assessing the availability and performance of zero-emission technology to further reduce emissions. For more information, visit: <https://ww2.arb.ca.gov/our-work/programs/cargo-handling-equipment>.

Chrome Plating Control Measure Amendments – This strategy will amend the current regulation on chrome plating to further reduce toxic air contaminants at chrome plating facilities, with a focus on alternative technology. In September 2020, a meeting of the technical work group was held to discuss concepts. A tentative Air Toxics Control Measure (ATCM) timeline is to finalize concepts in late 2021 and hold workshops for regulation in winter and spring of 2022. For more information, visit: <https://ww2.arb.ca.gov/our-work/programs/chrome-plating-atcm>.

In-Use Locomotive Regulation – In the absence of federal action to address harmful emissions from locomotives, CARB is developing the In-Use Locomotive Regulation to reduce criteria pollutants, toxic air contaminants, and greenhouse gas emissions. The In-Use Locomotive Regulation is intended to be implemented statewide and aims to address regional pollution and long-standing environmental justice concerns with communities near railyards and other locomotive operations. Board consideration is tentatively scheduled for 2022. For more information, visit: <https://ww2.arb.ca.gov/our-work/programs/reducing-rail-emissions-california>.

Transport Refrigeration Unit Regulations – Transport refrigeration units congregate at distribution centers, railyards, and other facilities, resulting in the potential for health risks to those that live and work nearby. CARB is working through a public process to consider new requirements to transition the transport refrigeration units fleet to zero emission operations by requiring both zero emission technology and supporting infrastructure. For more information, visit: <https://ww2.arb.ca.gov/our-work/programs/transport-refrigeration-unit/new-transport-refrigeration-unit-regulation>.

ESTIMATED EMISSION REDUCTIONS FROM CARB MEASURES

The statewide strategy emission benefits provided in the CERP accounts for the combined effects of regulations currently under rulemaking for a given future year. It means that potential emission reductions from proposed regulations for a given year are applied on top of each other. For example, if two regulations are applicable to the same source of emissions (e.g., trucks) then a new baseline is established by applying the reductions from the first proposed regulation to the original baseline, and then reductions from the second regulation are calculated based on the newer established baseline.

It is important to note that most of these regulations are in early phases of development and their adoption and implementation timelines are not well established. Additionally, the emission inventory used to estimate the potential emission reduction factors for these strategies are derived from draft inventories that will continue to be revised through the regulation development process. Once a statewide strategy or regulatory measure is adopted, emission reduction factors and related benefits will be updated to reflect the final inventory used in the regulation. As such, the draft statewide emissions reduction estimates presented in the CERP should only be used as a rough estimate that are subject to change in future.

CARB has estimated the emission reductions benefits for some of the proposed statewide measures as shown in Table 4-1 for the 2026 and 2031 milestone years for the Arvin/Lamont Community.

Table 4-1 Estimated Emission Reductions from CARB Measures in the Arvin/Lamont Community

Proposed Statewide Measures	Estimated Potential Emission Reductions in Future Year (tons per year)							
	PM2.5		DPM		NOx		VOC	
	2026	2031	2026	2031	2026	2031	2026	2031
Advanced Clean Fleet	0.02	0.15	0.01	0.07	0.73	5.31		
Advance Clean Car II	0.003	0.05	0.00003	0.0002	0.10	1.21	0.05	0.94
Heavy-Duty Inspection and Maintenance	0.34	0.38	0.36	0.40	31.57	39.12		
Small Off-Road Engine Amendment	0.05	0.13			0.54	1.72	4.12	11.85
Transport Refrigeration Unit Regulation	0.18	0.39	0.19	0.41	0.56	1.33	0.07	0.18
Total	0.60	1.09	0.56	0.88	33.50	48.70	4.24	12.98

CARB ENFORCEMENT

Arvin/Lamont 3 Year History

The California Air Resources Board's (CARB) Enforcement Division aims to develop partnerships with community organizations to co-lead the development of community-focused action plans that reduce disproportionate exposures in disadvantaged communities. CARB has heard the concerns of the community that has been shared with us during the Arvin/Lamont CSC Meetings.

Residents have expressed their concerns about potential sources of environmental pollution. Many are concerned about the adverse health effects from the oil fields (both active and idle wells) and the operation of heavy-duty diesel trucks in their community. There are concerns that California oil and gas operations have been emitting excessive amounts of greenhouse gas (GHG) emissions, resulting in a possible increased risk to nearby communities, and these communities experience negative impacts by the operations.

CARB is responsible for regulating greenhouse gas emission sources from oil and gas facilities. In 2017, CARB adopted the California Oil and Gas Regulation (COGR) to reduce fugitive and vented methane emissions from new and existing oil and gas facilities. The regulation requires owners and operators of oil and gas facilities to regularly conduct leak detection and repair of applicable equipment, repair emission exceedances, keep records of these actions, and report certain information to CARB or local air districts. Local air districts are responsible for regulating criteria pollutant emissions from oil and gas wells. CARB is charged with enforcing its regulations applicable to mobile sources, consumer products, and other area-wide categories, fuels, and climate programs. CARB is also charged with overseeing the implementation of local air district permit and enforcement programs implementing requirements that apply to stationary industrial pollutant sources. In addition, CARB has direct enforcement authority over climate programs, many of which impact stationary sources directly or indirectly.

Diesel Vehicle Enforcement

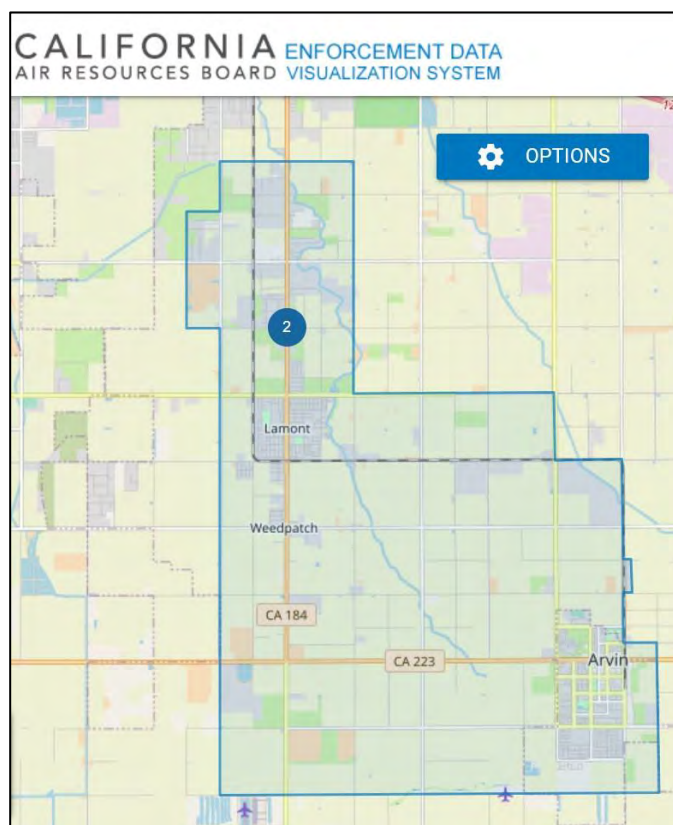
CARB regulations establish stringent emission requirements that new diesel vehicles must meet. These requirements required engine manufacturers to meet lower particulate matter and NOx emission standards. Many manufacturers included the installation of diesel particulate filters to meet the PM standard, as well as exhaust after treatment to meet the NOx emission standard. These devices remove more than 98 percent of toxic diesel emissions when properly functioning. In addition, because diesel engines and heavy-duty vehicles and equipment are designed to last decades, CARB's diesel fleet regulations require operators to replace older, higher polluting vehicles and equipment with cleaner vehicles, equipment, and technologies to provide emission reductions as quickly as possible. These regulations apply to operators of on-road diesel vehicles such as trucks, and off-road diesel vehicles and equipment including construction and cargo handling equipment, transport refrigeration units, commercial harbor craft, and other sources. As a result of these programs, CARB

has greatly reduced diesel particulate and NOx emissions by over 90 percent in communities statewide.

Figure 4-11 Programs CARB Enforces



Below is a description of the three-year history of inspections in the community. This information can also be found in CARB's EDVS ([Enforcement Data Visualization System – California Air Resources Board](#)). A guide to how to use EDVS is here: [Enforcement Data Visualization System \(ca.gov\)](#). During the three-year period of 2019 through 2021, as illustrated in Figure 4-12 below, CARB conducted two inspections within the boundary for compliance with the Truck and Bus regulation and found both trucks to be compliant.

Figure 4-12 EDVS Image of Enforcement Activity in Arvin/Lamont

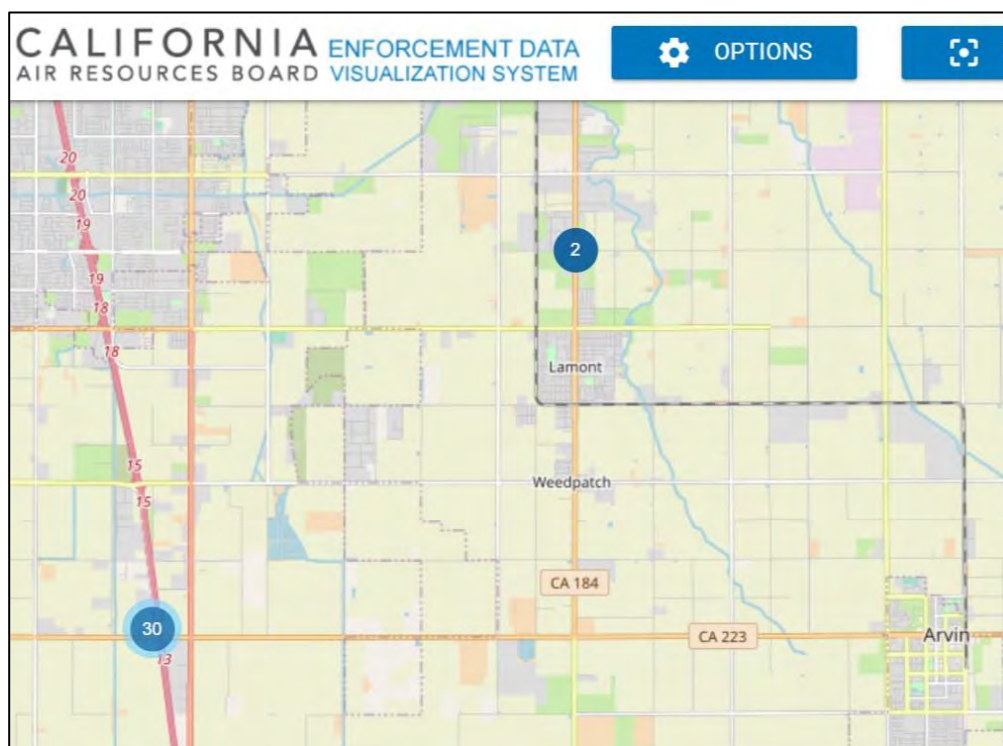
Nearly all trucks and buses in California are already, or will be, required to have a certified 2010 or newer model year engines by the end of 2023 to comply with CARB's Truck and Bus rule to legally operate in California.³³ In fact, California is entering its third year where the California Department of Motor Vehicles (DMV) is holding registration for some trucks and buses that are not in compliance with CARB's Truck and Bus rule as a requirement of Senate Bill 1. Due to CARB regulation outreach and enforcement efforts, the compliance rate statewide for the rule was 98 percent in 2020.

As reported in EDVS, CARB conducted 30 inspections of trucks at two locations right outside of the community border (see Table 4-2, Figure 4-13 below). Out of the 30 inspections, 3 violations were observed. Of those 3, one was an emission related violation. Due to the proximity of the truck stops where the inspections took place to the community boundary, it is anticipated that some of these trucks operated within the community boundary. CARB will work to prioritize inspection locations to ensure that sufficient enforcement is taking place in the community.

³³ CARB, The Truckstop – Truck and Bus Regulation, <https://ww2.arb.ca.gov/sites/default/files/truckstop/tb/truckbus.html>

Table 4-2 Enforcement near Arvin/Lamont 2019-2021

Program	Inspections	Violations	
		Emissions	Non-Emissions
Heavy-Duty Vehicle Inspection Program (HDVIP)	1	0	1
Idling	28	1	0
Transportation Refrigeration Unit (TRU)	1	0	1
Total	30	1	2

Figure 4-13 EDVS Image of Enforcement Activity near Arvin/Lamont



CARB's idling rules cover commercial vehicles, like trucks and buses, school buses, and off-road equipment. In general, there is a 5-minute idling limit statewide, but the rule allows vehicles and equipment to idle for longer periods under specified conditions, like when trucks are lined up waiting to get into a warehouse. CARB conducted 28 idling inspections near Arvin/Lamont from 2019-2021. One of those vehicles was out of compliance with the idling regulation.

Transportation refrigeration units (TRUs) keep goods cooled (or heated) in cargo containers during transport and are regulated by CARB under the TRU regulation. CARB conducted one inspection of a TRU between 2019 and 2021 near Arvin/Lamont and found one violation for failing to properly label the equipment. This unit was compliant with engine technology and emissions requirements. CARB's TRU rule generally has lower compliance rates, so identifying areas where TRUs operate in Arvin/Lamont will help CARB target inspections to enhance compliance and reduce emissions in the community.

Complaints

CARB received five complaints from the Arvin/Lamont community in the 2017-2021 time period. There are three pathways that CARB Enforcement may follow to address a complaint. One, our staff can take enforcement action based on the complaint which can lead to a notice of violation. Sometimes the investigations can take a long time and other times the complaints are not actionable because CARB has not received enough information to be able to initiate an investigation. Based on the nature of the complaint, we may refer the complaint to another agency that has appropriate jurisdiction. Of the five complaints received in this community, four alleged violations of CARB's Periodic Smoke Inspection Program opacity limits and the fifth alleged truck tampering. Three of these complaints are under investigation and two have resulted in enforcement action being taken.

Truck and Bus

California Department of Motor Vehicles (DMV) began holding registration for trucks and buses that are not in compliance with CARB's Truck and Bus rule in 2020 as a requirement of SB 1. Due to the strength of the Truck and Bus regulation and CARB and DMV's outreach and enforcement efforts, the compliance rate statewide for that rule is 98 percent. In Arvin/Lamont, the compliance rate for this regulation is also 98 percent, based on California DMV registration data. This means that of the 1450 trucks and buses registered in Arvin/Lamont, 1426 were compliant with the Truck and Bus regulation. CARB Enforcement is looking into the non-compliant trucks and ensuring that appropriate action is taken to confirm vehicle compliance.

Oil and Gas

As mentioned earlier, there are community concerns with emissions from oil and gas operations. The California Oil and Gas Regulation (COGR) reduces fugitive and vented methane emissions from new and existing oil and gas facilities. This regulation

is enforced by the SJVAPCD on behalf of CARB. CARB has been attending the IVAN (Identifying Violations Affecting Neighborhoods) Kern meetings. Some of the concerns brought up by community members include: large releases of VOC emissions from small producer sites near residents; toxic plumes from sites that are being prepared for drilling; large yellow/black smokes from the refinery and flaring activities; emissions from oil and gas sites with historical instances of leakage; and improper oil spill disposal. The community has specifically stated that they: want tighter regulations for the oil industry; to amend or change emission exemptions from small producers; to understand emission sources, which includes the location of the wells and pipelines in their community.

CARB is working in collaboration with the community and the San Joaquin Valley Air Pollution Control District to inspect oil and gas facilities in Arvin/Lamont for compliance with local and state regulations and determine if regulations might be strengthened to better protect the community. During the inspections going forward, CARB will look at all sources of pollution located at these facilities, including stationary, portable, and mobile. CARB uses inspection equipment like mobile monitoring, Optical Gas Imaging cameras, Toxic Vapor Analyzers, Infrared Optical Gas Detectors, and Eagle Gas Monitors as well as drones. CARB will document the results of the inspections and summarize what was learned in a report back to the community.

Since May 2021, CARB has inspected Petro Capital Resources Arvin and Termo Arvin oil and gas facilities. CARB staff looks forward to working with the community and other agencies to conducting more inspections in the Arvin/Lamont area and specifically address their oil and gas concerns. For more information on COGR, please visit: [Oil and Gas Methane Regulation](#).

Supplemental Environmental Projects

Enforcement is not a tool to solve all problems but can be a part of the overall efforts to address air quality concerns. CARB has a Supplemental Environmental Project (SEP) policy that allows community-based projects to be funded from a portion of the penalties received during the settlement of enforcement actions. SEPs can improve public health, reduce pollution, increase environmental compliance, and bring awareness to communities most burdened by environmental harm. These projects can range from vegetative barriers to school air filtration projects. Community members have expressed interest in incentive projects that could potentially be funded by SEPs such as urban greening, electric vehicle charging stations, and public fleet vehicles. CARB staff can help community members or organizations identify where SEPs would be more impactful and assist with the submittal of proposals. For more information on SEPs, please visit: [Supplemental Environmental Projects \(SEP\)](#).

Community Enforcement Plan

To increase our presence in the community, CARB commits to partner with the community and the District to work together to develop an enforcement plan for CARB enforcement work. In order to do this, CARB commits to:

- Meeting with the community and conducting tours and listening sessions with their stakeholders
- With the help of the community, developing a timeline of community plan implementation within months of CERP approval.
- Partnering with agencies, as necessary, for the implementation of the community enforcement plan

CARB, in collaboration with community representatives and the District, will issue a community “investigation” report that maps emission sources, highlights community concerns, enforcement results and findings, details the root cause(s) of those community concerns, and develops recommendations to address them. We will conduct community-prioritized enforcement work and then deliver a short and focused community-assessment report describing the results of our work, and recommendations for both further work and future engagement through CARB, CalEPA, and other Boards / Departments as appropriate. These reports will be posted to our website. We will also summarize the lessons learned in our Annual Enforcement Report and engage in a community led process to continue prioritizing projects in a way that will have maximum impact for Arvin/Lamont.

Community Concerns

In addition, CARB enforcement relies on community input for identifying additional locations and sources of concern. Please contact us through the online CalEPA complaint system at: [About the Environmental Complaint System | CalEPA](#), or via phone at: 1 (800) 242-4450 to share your air pollution concerns.

5. METRICS TO TRACK PROGRESS

Strategies implemented as a part of this CERP are designed to improve air quality in the community of Arvin/Lamont. The five-year milestone evaluation is intended, per CARB guidance, to illustrate community scale emissions reductions and air quality trends that may not be evident on an annual reporting basis. To this end, the five-year milestone report submitted to CARB for Arvin/Lamont will include a comprehensive report explaining how air quality data obtained as part of the CAMP and the resulting analyses provided to CSC members helped inform ongoing implementation of CERP strategies and, to the extent possible, how these strategies resulted in lowering emissions in the community.

Additionally, the report will include a complete accounting of all projects, emissions reductions, and associated co-benefits implemented as a result of AB 617 program implementation in the community of Arvin/Lamont.

The tables below illustrate the emissions reduction and project metrics that will be used to report progress made toward meeting the CSC-derived community emissions and exposure reduction goals.

Table 5-1 Target Funding and Emissions Reductions for Incentives Measures

						Target Reductions Total Lifetime Tons		
Number	Measure	Unit Type	Units	% of Committee Support	CSC- Recommended Incentive Allocation	NOx	PM2.5	VOC
Incentives - Heavy-Duty Trucks & Equipment								
1.A	Heavy-Duty Truck Replacement**	Trucks	25	79%	\$5,000,000	96	2	7
1.B	School Bus Replacement*	School Buses	4	81%	\$1,600,000	7	0	1
1.C	Ag Equipment Replacement**	Vehicles	50	100%	\$4,500,000	187	13	0
1.D	Alternatives to Ag Burning*	Acres	1000	100%	\$1,400,000	58	110	100
Incentives - Residential Benefits								
2.A	Residential Lawn/Garden Equipment*	Mowers	350	97%	\$175,000	0.1	0.1	2
2.B	Commercial Lawn/Garden Equipment**	Units	6	59%	\$150,000	Emissions Reductions Expected Pending CARB Methodology		
2.C	Residential Vehicle Repair*	Cars	450	61%	\$360,000	4	0	0
2.D	Residential Vehicle Replacement*	Cars	200	55%	\$4,000,000	1.9	0.1	0
Incentives - Community Services								
3.B	Urban Greening*	Trees	500	54%	\$500,000	Emissions Reductions Expected Pending CARB Methodology		
3.C	Vegetative Barriers*	Trees	500	81%	\$500,000	0.25	0.01	0
3.D	Road Improvements, Sidewalks & Bike Paths*	Projects	6	77%	\$12,000,000	18.6	10.2	37.8
3.E	Public Fleet Vehicles**	Vehicles	20	59%	\$400,000	0.1	0	0.1
3.F	Incentives for ebikes*	Bikes	TBD with CSC	55%	No CERP Funding	Emissions Reductions Expected Pending CARB Methodology		
*New program or incentives greater than existing program **Enhanced access, priority for current program						372.5 NOx	135.4 PM2.5	148.3 VOC
Total Estimated Emissions Reduction Target (tons)								

Table 5-2 Metrics to Track Regulations, Enforcement, Partnerships, and Outreach Measures

Number	Measure	Metric(s)	Commitment	Communication of Progress to CSC	Report Frequency Timeframe
Regulations and Enforcement					
4.A	Enhanced Inspection Frequency	Inspections	2 inspections per year for facilities with emissions violations	Facility names Violation Description Inspection Dates	Quarterly 5 years
4.B	Stationary Source Rulemaking	Regulations	8 rules	Workshop Opportunities Public notices	Monthly Until rulemaking complete
4.C	Expedited AB 2588 Assessment	Facility Assessments	All facilities within Arvin/Lamont Boundary	Facility names Prioritization Next Steps (as needed)	Monthly 5 years
4.D	Fugitive Dust Enforcement	Inspections	1 targeted enforcement effort in 2nd and 3rd quarter	Facility names Violation Description Inspection Dates	Quarterly 5 years
4.E	Heavy-Duty Idling Enforcement	Inspections	1 targeted enforcement effort each quarter	Violation Location Violation Description Inspection Dates	Quarterly 5 years
Agency Partnerships					
5.A	Pesticide Measures	- Monitoring Efforts - Notification Progress	Expanded monitoring, analysis, & notification development	Workshop Opportunities Public notices Monitoring Progress	Monthly 5 years
5.B	Support Land Use Agencies	Meetings	1 District meeting per quarter with land use agencies	Public Engagement Opportunities Meeting Outcomes	Quarterly 5 years
5.C	Heavy-Duty Truck Rerouting	Project Progress	Follow ongoing effort to assess truck route alternatives	Public Engagement Opportunities Meeting Outcomes	Quarterly 5 years
5.D	Address Potential Impacts From Idle Oil Wells In Community	- Public Meetings - Community Engagement	District to inform CSC of opportunities to engage with CalGEM to prioritize idle wells	Public Engagement Opportunities Meeting Outcomes	Quarterly 5 years
Outreach					
6.A	Community Awareness and Knowledge of Air Quality	- Community Meetings - Targeted Social Media Ads	4 meetings per year 1 social media campaign per year	Meeting Notices Social Media Campaign Concepts	Quarterly 5 years
6.B	Illegal Burning Outreach	Community Meetings	4 meetings per year	Meeting Notices	Quarterly 5 years
6.C	HAL Schools Program & Emission Free Zone	- Signs for Schools - HAL Schools Enrollment	Enroll and give signs to all schools in Arvin/Lamont boundary	School Outreach Concepts HAL Schools Feedback	Quarterly 5 years

6. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) PROJECT REVIEW

According to Section 15061 (b)(3) of the California Environmental Quality Act (CEQA) Guidelines, a project is exempt from CEQA if, “the activity is covered by the common sense exemption that CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.” Since the Project will result in an air quality benefit to the community, the Project is not expected to result in a significant impact under CEQA. As such, the common sense exemption applies.

In addition, this Project is an action taken by a regulatory agency, the San Joaquin Valley Air District, as authorized by state law for the protection and betterment of air quality in the San Joaquin Valley. CEQA Guidelines §15308 provides a categorical exemption for “actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. Construction activities and relaxation of standards allowing environmental degradation are not included in this exemption.” No construction activities or relaxation of standards are included in this project. As such, for this additional reason, the District finds that the Project is exempt from CEQA.

Pursuant to Section 15062 of the CEQA Guidelines, the District will file a Notice of Exemption upon Governing Board approval of the Project.

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Exhibit B.
Declaration of Olivia Muñoz

DECLARATION OF OLIVIA MUÑOZ

I, Olivia Muñoz, declare as follows:

PERSONAL BACKGROUND

1. I have personal knowledge of the facts stated in this declaration and, if called as a witness, could and would testify competently thereto.

2. I am a resident of Fuller Acres, California. My home is located approximately 0.5 miles from the Kern Energy refinery facility located at 7724 East Panama Lane, Bakersfield, California 93307.

3. I was born in Austin, Texas in the year 1942. I am currently 84 years of age.

4. My family migrated to Lamont in Kern County in the year 1945. I have lived with my family in Fuller Acres, Lamont, or the surrounding area since the age of three.

5. My father purchased a 19.5 acre parcel of land in Fuller Acres in the year 1967. I currently reside on this property. I have lived on this property periodically throughout my life for a total of approximately 35 years.

6. I am a member of 184 Community Action Group, an unincorporated association of residents from Fuller Acres and the surrounding area.

PERSONAL KNOWLEDGE QUALIFIES CONCERNS

7. As an oil field technician for Chevron and the Independent Valley Energy Company (IVEC), I acquired personal knowledge of the negative impacts of oil extraction, oil refining, and associated industrial activities on the environment.

8. The personal knowledge I acquired as an oil field technician further informs my concern that the hydrogen-related project at the refinery will negatively impact the environment.

9. I worked as an oil field technician at Chevron's Bakersfield Oil Field for approximately three and a half years beginning in the early 1980s. I went on to work for Chevron

1 for approximately three and a half years after that. In the late-1980s, I was sent to work in
2 Gaviota on a project transporting crude oil from Channel Islands to Gaviota.

3 10. As an oil field technician, I learned to inspect and maintain oil extraction
4 equipment and I witnessed firsthand the negative impacts of oil extraction and transportation on
5 the local environment. When working on the oil project in Gaviota, I remember project managers
6 instructing employees to dispose of chemicals in nearby gullies. I remember witnessing a decline
7 in the local population of monarch butterflies and eucalyptus trees as a result of the disposal
8 practices.

9
10 11. From working on oil projects, I learned that oil refining and its associated
11 operations contaminate local air and water sources, and that they consume a lot of water.

12 **ENVIRONMENTAL DEGRADATION OVER TIME**

13 12. The refinery now known as Kern Energy has been in existence and in operation
14 throughout my entire life. As a child living near the refinery, I used to spend a lot of time
15 outdoors playing with the children in my community. To this day, I continue to spend a lot of time
16 outdoors tending to my yard. I can see the refinery clearly from my front yard.

17
18 13. Over the past 81 years, I have closely observed the degradation of my immediate
19 surroundings due to the refinery's operations. Degradation includes increased traffic, destruction
20 of native habitats, air pollution, water and soil contamination, and groundwater subsidence. These
21 impacts have worsened as the refinery has expanded its operations and footprint over time.

22 14. As a child living in Fuller Acres in the 1940s and 1950s, I could cross the street to
23 play alongside the other children in my neighborhood without the fear of being hit by a large
24 semi-truck. Today, I have noticed that children are no longer able to play outside nor cross the
25 street safely because of the increased traffic along Weedpatch Highway and Panama Lane.

26
27 15. Fuller Acres and the area surrounding it looked much different when I was a child.
28

1 The area was open land with many native plants and animals, including cottonwood trees, rabbits,
2 kit foxes, bats, owls, and rattle snakes. I remember that the San Joaquin kit foxes would make
3 their burrows on my property. Natural marshlands would form near my home during the rainy
4 seasons.

5 16. I no longer see bats near my home. Marshlands no longer form nearby. The last
6 time I saw a kit fox on my property was approximately four years ago, when I found one dead in
7 the yard. I see rattle snakes much less frequently. I have only seen one owl in recent years.
8 Almost all of the cottonwood trees have been cut down. There are a lot more gophers and insects,
9 including gnats and spiders, on my property. I suspect that there are more pests on my property
10 because the predator species—including the kit foxes, bats, owls, and rattle snakes—that used to
11 regulate the size of their populations are no longer present. I suspect that the predator species are
12 no longer present because the refinery has destroyed and contaminated their habitats as it has
13 expanded over time.
14

15 17. When I was young, the children in the neighborhood and I would swim in the
16 canal that runs through Fuller Acres. Today, the canal is often dry. When there is water in it, it is
17 extremely smelly and unpleasant.
18

19 18. As a child, I used to be able to see the snow-capped mountains of the Sierra
20 Nevada mountain range very clearly from Fuller Acres. Today, my view is clouded by the air
21 pollution and the mountains are no longer covered in snow.

22 19. My family and I have grown our own food on the land near the refinery since
23 1945. From the 1940s to the 1990s, we were able to successfully grow a wide variety of fruits,
24 nuts, and vegetables on the land, including asparagus, garlic, almonds, pecans, tomatillos,
25 tomatoes, lemons, peaches, plums, and more. The quality of our harvests has declined over time.
26 The quality began to decline dramatically approximately seven years ago, around the time that I
27
28

1 began to notice oil in my water more frequently.

2 20. To this day, I continue to grow the same food that my family has been growing on
3 this land since the 1940s. However, it has become increasingly difficult and even impossible to
4 produce the same quality harvests. The fruit is much smaller in size and less sweet. The pecans
5 are black on the inside. My harvests are much smaller. I have had to chop down several of our
6 trees because they became sick or were no longer productive. Many of the trees that remain are
7 infected with fungus.

8 21. I have tried to improve my harvests by applying more fertilizer to the ground, but
9 it does not help. I try to plant and maintain native plants on my property for the health of the local
10 ecosystem, but it is difficult.

11 22. I suspect that it has become more difficult and even impossible to produce quality
12 harvests on my property because the refinery's operations have contaminated the soil, water, and
13 air and depleted the groundwater. I believe these contaminations occur when the refinery spills oil
14 and other chemicals on the ground and when it flares toxic fumes into the air. I have seen debris
15 and dust from the highway be stirred up by the semi-trucks that are driving to the refinery and
16 that debris and dust coats my entire garden.

17 23. I am worried that the soil is contaminated with oil and other chemicals. The soil's
18 water retention has also decreased dramatically over time. Even though I regularly water my
19 garden, the soil does not have good water retention and it is difficult to keep my plants hydrated. I
20 suspect that the soil does not have good water retention because the refinery uses a large amount
21 of water and depletes the groundwater under my property.

22 24. Keeping my plants hydrated has also become more difficult because the air is
23 much drier today than it was when I was young. There is no longer as much fog during the cold
24 months and the fog that does form is not as thick as it used to be. The thick fog was good for the
25
26
27
28

1 earth and the plants.

2 25. Frequently wildfires in the mountains near my home also make it difficult to grow
3 plants because the contaminated air is bad for the plants.

4 26. I believe these environmental changes have also affected the large-scale farmers
5 that own the properties surrounding my home. The farmer who operates the land immediately
6 adjacent to my home has been unsuccessful in his harvests.

7 **CURRENT SAFETY/HEALTH ISSUES**

8
9 27. Although I enjoy spending time outdoors, I often have to go inside because of the
10 unpleasant smells from the refinery. There is regularly a smell of rotten eggs or natural gas
11 coming from the refinery. The smell is nauseating and gives me headaches. The smell, nausea,
12 and headaches are especially bad when the refinery releases flares. I know this because I see the
13 smoke travel from the smoke stacks towards me. I can see the refinery's smoke stacks from my
14 front porch. When I go inside, I close all of my windows but I can still smell it from indoors.
15 Sometimes I go to the senior center in Lamont or Greenfield to avoid the smell.

16
17 28. The unpleasant smells from the refinery are especially difficult in the summer. The
18 temperature gets very hot in the summer in Fuller Acres and closing the windows can be
19 suffocating. Very few people in my community can afford to install and maintain air conditioning
20 units or filtration systems in their homes and instead use swamp coolers to keep cool, which draw
21 in the unpleasant odors from the refinery into homes. We have to choose between exposing
22 ourselves to the unpleasant smells from the refinery or extremely hot indoor temperatures.

23 29. The consistent smell of gas is concerning to me and my neighbors. My daughter
24 worries that the smell of gas is coming from a gas leak within my home. Due to this concern, she
25 pays PG&E to conduct frequent, non-routine inspections for gas leaks in my home.

26
27 30. I often see flares coming from the refinery, especially early in the mornings. This
28

1 concerns me because I know the flares are burning off toxic fumes that are dangerous to inhale.

2 31. There are some nights where I wake up in the middle of the night because I feel
3 like I am choking on the air. I cannot open the windows because of the high-speed traffic in front
4 of my home and the unpleasant smell from the refinery.

5 32. I frequently clean the filters, fan blades, and floors inside my home. Even though I
6 clean them so frequently, they quickly become very dirty because of the air contaminants and
7 pollution that make their way indoors. The frequent high speed, heavy-duty traffic outside my
8 home lifts up the dust from the agricultural fields and other industrial operations nearby. That dust
9 ends up coating everything inside my home and all of the plants in my garden.

10 33. I obtain water from a private groundwater well located on my property. Over the
11 past three decades, there have been various instances where the water that comes out of my faucet
12 is contaminated with oil. This has occurred with greater frequency in the past seven years. The
13 most recent time that I observed oil in my water was approximately 6 months ago. The
14 contaminated water has a strong odor of petroleum. The smell persists even when the oil is no
15 longer visible in the water. When consumed, the water tastes like oil.

16 34. I have reported the presence of oil in my water to Kern Energy several times
17 because I suspect that the oil originates from their refinery operations. I have been told various
18 times by Kern Energy representatives that they are not responsible for the presence of oil in my
19 groundwater. I believe that they are not telling the truth.

20 35. I have also reported the presence of the oil to the Kern County Public Health
21 Department ("Public Health Department") several times. The Public Health Department has
22 tested the water from my well several times but has not taken any action to prevent this issue
23 from continuing.

24 36. Although my family and I used to drink the water from my groundwater well, I no
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1 longer feel safe consuming the water. I stopped drinking water from my well approximately seven
2 years ago. Instead, I pick up bottled water containers from a dispenser in Lamont, located
3 approximately two and a half miles from my home. This is difficult for me because I am elderly
4 and do not have the strength and mobility necessary to carry and transport the bottled water
5 containers. Sometimes my neighbors help me by delivering bottled water containers to my home.

6 37. I continue to use the water from my groundwater well to wash my dishes, wash my
7 clothes, and to shower.

8 38. I have witnessed the refinery expand through the gradual purchase of property in
9 Fuller Acres. I am fearful that the refinery will continue to expand and try to purchase the
10 agricultural field next to my home. Since it has become more difficult to produce successful
11 harvests on the surrounding agricultural fields, it is more profitable to the farmers to sell their
12 property to the refinery. I am fearful that the refinery will try to purchase my property as well.

13 39. I am fearful that I will need to evacuate my home at a moment's notice because of
14 a chemical explosion at the refinery. I fear the refinery will be targeted in an act of war against the
15 United States or that a large earthquake will cause a disaster.

16 **PROJECT-SPECIFIC CONCERNS**

17 40. I understand that Kern Energy is proposing construction and operation of a
18 hydrogen-related project at the refinery facility. I became aware of this project through
19 conversations with my neighbors. I learned more about the project through my participation in the
20 resident group that is now named 184 Community Action Group.

21 41. Based on my experience living in Fuller Acres and the existing environmental
22 conditions in the area, I am concerned that this project will further increase pollution, industrial
23 activity, safety risks, traffic, noise, and other impacts affecting nearby residents.

24 42. I am concerned that the hydrogen project will negatively impact my water access
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1 by increasing the refinery's consumption of water and/or resulting in the further contamination of
2 groundwater.

3 43. I am concerned that the hydrogen project could cause a chemical explosion or
4 disaster. I have lived through several explosions from the refinery, including the explosion that
5 occurred caused by the magnitude 7.5 earthquake on July 21, 1952. On the morning of July 21,
6 1952, I remember feeling the strong earthquake and seeing the refinery explode outside my home.
7 The sky lit up with orange sparks and my father covered my siblings and I with a cot to protect
8 us. The refinery has expanded significantly since 1952 and the surrounding area has become
9 much more populated. Surely an earthquake today would be much more catastrophic for the
10 refinery than the 1952 earthquake. I think more safety precautions are necessary to protect
11 residents of the surrounding area.
12

13 **CUMULATIVE IMPACTS TO THE COMMUNITY**

14 44. My neighbors and I experience very high environmental burdens, particularly with
15 regards to air quality and water access. The air we breathe is filled with pollution from all of the
16 heavy-duty trucks and industrial operations nearby. My neighbors and I rely on bottled water,
17 typically purchased and hauled from dispensers located several miles away. We cannot bear any
18 expansion of industrial activities in our vicinity that may impact our air quality or our already
19 strained access to water.
20

21 45. Residential housing has expanded in my community over the years. This has
22 created an increased risk to the health and wellbeing of the local population due to strained access
23 to environmental resources, like clean water.

24 46. Although my neighbors and I have advocated against it, industrial operations have
25 expanded in our community over the years. Industrial agricultural fields, including a 60 acre
26 almond farm located a quarter mile from my home, contaminates our air with pesticides. I am
27
28

1 concerned about contaminants from the asphalt supplier that is located across the street from my
2 home.

3 47. The increased industrial operations have increased the amount of vehicles
4 traveling through my community, especially heavy-duty trucks. The large open lot across the
5 street from my home was used to station semi-trucks for many years. The traffic from that
6 operation was very dangerous. In 2024, a semi-truck that was exiting the lot caused an accident
7 with a car that was driving along Weedpatch Highway. The driver of the car, a young man, died in
8 front of my home.

9
10 48. The increase in traffic is especially concerning because it directly threatens the
11 safety of children who wait for the school bus alongside the road on which heavy-duty trucks pass
12 by. The traffic is especially bad in the mornings and afternoons when people are driving to and
13 from work. This is also the time that children are getting on and off the bus. There are no
14 sidewalks, so children walk and stand on the side of the road with no protection from the trucks.
15 There was an instance in which a child almost died because of this issue.

16
17 49. Heavy-duty vehicles, including semi-trucks, drive past my home into the Kern
18 Energy refinery everyday at all hours. Oftentimes, a long line of semi-trucks forms at the entrance
19 of the refinery and the line extends to Weedpatch Highway. Semi-trucks frequently idle in front of
20 my home for several hours and I am unable to access my driveway.

21 50. Sometimes semi-trucks block traffic in both directions along Weedpatch Highway
22 because the semi-trucks make wide right-turns onto Panama Lane. Residents of homes all along
23 Weedpatch Highway are unable to get in and out of their homes. This is concerning because we
24 need to travel to nearby towns for necessities.

25
26 51. Living in such close proximity to several packing warehouses concerns me. They
27 also increase the frequency and quantity of heavy-duty trucks driving through my community.
28

1 52. The constant traffic of semi-trucks shakes my home and causes objects to fall off
2 of the walls. In one instance, a picture frame fell off of the wall and landed on my
3 brother-in-law's head.

4 53. Although we regularly see regulatory violations by industrial operators in our area,
5 residents of my community are less likely to file formal complaints because they fear retaliation.
6 This fear is intensified by the current political campaign to scare and intimidate Latinos in the
7 United States. The majority of my community is composed of Latinos.

8 54. The jobs available to residents of my community have high risks and negative
9 health impacts. My family and I have worked as farmworkers in the surrounding agricultural
10 fields and dairy farms, technicians in the surrounding oil and gas fields, and as fruit packers in the
11 surrounding agricultural warehouses. Our labor experiences are representative of other members
12 of my community.

13 55. The environmental health risks and burdens of working in the available workforces
14 are significant. Health risks and burdens include regular exposure to high concentrations of
15 pesticides, nitrates, and other chemicals; intense labor in high temperatures; and slipping and
16 tripping hazards.

17 56. My husband passed away from liver cancer. I suspect he developed cancer because
18 he was a tractor operator and was regularly exposed to high concentrations of pesticides.

19 57. There are many oil wells near my home. In 1967, when my father purchased the
20 property on which I currently reside, there were two sealed oil wells on the property. His purchase
21 of the property included the mineral rights associated with those wells. Corporations would often
22 contact my family requesting to purchase our mineral rights so that they could continue exploring
23 and drilling for oil on our property. The last time that I received one of these requests was
24 approximately 15 years ago. We have always refused. I do not want oil drilling on or near my
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property. The environmental impacts of oil drilling concerns me.

58. The transportation of crude oil into the refinery via pipelines and trains concerns me. I worry that there will be leaks or a large spill.

59. My neighbors and I regularly experience sore throats and respiratory irritation because of the poor air quality in our community.

60. The children in my community are especially vulnerable to health problems caused by contaminants in the air. My neighbors tell me that their children experience regular bloody noses and have asthma or cancer.

61. The canal that runs through my community concerns me. When there is water in it, the water smells very bad, like animal manure.

62. It is wonderful that the Fuller Acres Pocket Park was installed in Fuller Acres on Hilltop Drive. However, that is not sufficient to balance all of the environmental risks and burdens that we face.

63. I was previously unaware of my community's status as an AB 617 community. Had I known, I would have been engaging in the program since the beginning. I would have been eager to engage because the air quality of my community directly affects me. I always encourage my neighbors to participate in advocacy as we are made aware of the opportunities.

64. My family members regularly tell me that I should leave my home because living here is poisoning me but I do not want to leave because this is my home. I do not have anywhere else to go.

65. I make this declaration in support of ensuring that the potential environmental and community impacts of the proposed project are fully evaluated and considered.

1 I declare under penalty of perjury under the laws of the State of California that the
2 foregoing is true and correct.

3 Executed on 5/29/2026, 2026, at Fuller Acres, California.

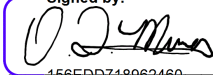
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Exhibit C.
Authority to Construct Application
Review Package



April 30, 2026

Gabe Castro
Kern Energy
7724 E Panama Lane
Bakersfield, CA 93307

RE: Final - Authority to Construct / Certificate of Conformity (Significant Modification)
Facility Number: S-37
Project Number: S-1251187

Dear Mr. Castro:

The Air Pollution Control Officer has issued the Authority to Construct permit to Kern Energy to install a hydrogen power generation operation including fuels cells, hydrogen purification unit, hydrogenation and dehydrogenation process units, at 7724 E Panama Lane, Bakersfield, CA. Enclosed is the Authority to Construct permit and a copy of the notice of final action that has been posted on the District's website (<https://valleyair.org/>).

Notice of the District's preliminary decision to issue the Authority to Construct permit was posted on October 28, 2025. The District's analysis of the proposal was also sent to CARB and US EPA Region IX on October 28, 2025. All comments received following the District's preliminary decision on this project were considered.

Comments received by the District during the public notice period resulted in typographical corrections and clarifications for transparency purposes. These changes were minor and did not trigger additional public notification requirements, nor did they have any impact upon the Best Available Control Technology determination or on the amount of offsets required for project approval.

Also enclosed is an invoice for the engineering evaluation fees pursuant to District Rule 3010. Please remit the amount owed, along with a copy of the attached invoice, within 60 days.

Prior to operating with the modifications authorized by the Authority to Construct, you must submit an application to modify the Title V permit as an administrative amendment in accordance with District Rule 2520, Section 11.5. Application forms have been

Samir Sheikh
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: (661) 392-5500 FAX: (661) 392-5585

Mr. Gabe Castro
Page 2

enclosed for your use. These forms may also be found on the District's website at <https://valleyair.org/>.

Thank you for your cooperation in this matter. If you have any questions, please contact Ms. Erin Scott at (661) 392-5500..

Sincerely,



Brian Clements
Director of Permit Services

BC:dk

Enclosures

cc: Courtney Graham, CARB (w/enclosure) via email
cc: EPA Region 9 Air Permitting Manager (w/enclosure) via EPS

AUTHORITY TO CONSTRUCT

PERMIT NO: S-37-178-0

ISSUANCE DATE: 4/30/2026

LEGAL OWNER OR OPERATOR: KERN ENERGY
MAILING ADDRESS: 7724 E PANAMA LN
BAKERSFIELD, CA 93307-9210

LOCATION: PANAMA LN & WEEDPATCH HWY
BAKERSFIELD, CA 93307-9210

SECTION: 25 **TOWNSHIP:** 30S **RANGE:** 28E

EQUIPMENT DESCRIPTION:

HYDROGEN RECOVERY UNIT CONSISTING OF HYDROGENATION, DEHYDROGENATION, AND HYDROGEN PURIFICATION EQUIPMENT INCLUDING REACTORS, COMPRESSORS, HEAT EXCHANGERS, PUMPS, MISCELLANEOUS VESSELS, AND 7 PERMIT EXEMPT HYDROGEN FUEL CELLS

CONDITIONS

1. This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Prior to operating equipment under this Authority to Construct, permittee shall surrender VOC emission reduction credits for the following quantity of emissions: 1st quarter - 181 lb, 2nd quarter - 181 lb, 3rd quarter - 181 lb, and fourth quarter - 182 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.9 (as amended 4/20/23) for the ERC specified below. VOC ERCs used to satisfy the offset quantity required under District Rule 2201 must be surplus at the time of issuance of this ATC and the total quantity of ERCs surrendered shall be calculated based on the ERC surplus value percent discount of each ERC certificate used. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO



Brian Clements, Director of Permit Services

S-37-178-0 : 4/30/2026 9:41:35 AM -- KLEVANNND : Joint Inspection NOT Required

PEXH 000166

4. ERC Certificate Number C-1579-1 (or a certificate split from this certificate) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
5. VOC emission rate from fugitive components associated with this emissions unit shall not exceed 1.3 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit
6. For valves, flanges and connectors, a leak is defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 100 ppmv above background when measured per EPA Method 21. [District Rule 2201] Federally Enforceable Through Title V Permit
7. For pumps and compressor seals a leak is defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 500 ppmv above background when measured per EPA Method 21. [District Rule 2201] Federally Enforceable Through Title V Permit
8. The operator shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rule 2520, 9.5.2] Federally Enforceable Through Title V Permit
9. Permit holder shall maintain accurate component count and resultant emissions according to California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, CAPCOA/CARB Table IV-3a: CAPCOA -Revised 1995 EPA Protocol Refinery Correlation Equations. Permit holder shall update such records when new components are approved and installed. [District Rule 2201] Federally Enforceable Through Title V Permit
10. This unit is subject to Rule 4455 Leak Detection and Repair Conditions on the facility wide permit S-37-0. [District Rule 4455] Federally Enforceable Through Title V Permit
11. Permittee shall comply with all applicable testing, recordkeeping, and reporting requirements specified in Rule 4001 - New Source Performance Standards, including but not limited to Subpart A. [District Rule 4001] Federally Enforceable Through Title V Permit
12. Operators shall not depressurize any vessel containing VOCs unless the process unit turnaround is accomplished by employing one of the following operating procedures: The organic vapors shall either be recovered, added to the refinery fuel gas system and combusted; or controlled and piped to an appropriate firebox or incinerated for combustion; or flared, until the pressure within the process vessel is as close to atmospheric pressure as is possible. All process vessels shall be depressurized into the control facilities to less than 1020 mm Hg (5 psig) before venting/opening to atmosphere. All organic compounds which emerge from a refinery process vessel during the purging of said vessel and which otherwise would be emitted to the atmosphere shall be either directed to a flare or incinerator or shall be used for fuel until such disposition of emissions is not technically feasible or is less safe than atmospheric venting. [District Rule 4454] Federally Enforceable Through Title V Permit

Facility # S-37
KERN ENERGY
7724 E PANAMA LN
BAKERSFIELD, CA 93307-9210

AUTHORITY TO CONSTRUCT (ATC)

QUICK START GUIDE

1. **Pay Invoice:** Please pay enclosed invoice before due date.
2. **Modify Your Title V Permit:** Prior to operating the equipment authorized under this ATC, submit an application to modify your Title V permit. See application forms at <https://ww2.valleyair.org/permitting/title-v-operating-permits/application-forms/>.
3. **Fully Understand ATC:** Make sure you understand ALL conditions in the ATC prior to construction, modification and/or operation.
4. **Follow ATC:** You must construct, modify and/or operate your equipment as specified on the ATC. Any unspecified changes may require a new ATC.
5. **Notify District:** You must notify the District's Compliance Department, at the telephone numbers below, upon start-up and/or operation under the ATC. Please record the date construction or modification commenced and the date the equipment began operation under the ATC. You may NOT operate your equipment until you have notified the District's Compliance Department. A startup inspection may be required prior to receiving your Permit to Operate.
6. **Source Test:** Schedule and perform any required source testing. See <https://ww2.valleyair.org/compliance/source-testing> for source testing resources.
7. **Maintain Records:** Maintain all records required by ATC. Records are reviewed during every inspection (or upon request) and must be retained for at least 5 years. Sample record keeping forms can be found at <https://ww2.valleyair.org/compliance/recordkeeping-forms>.

By operating in compliance, you are doing your part to improve air quality for all Valley residents.

**For assistance, please contact District Compliance staff at
any of the telephone numbers listed below.**

Samir Sheikh
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: (661) 392-5500 FAX: (661) 392-5585

San Joaquin Valley Air Pollution Control District

Authority to Construct Application Review

Refinery Hydrogen Power

Facility Name: Kern Energy
Mailing Address: 7724 East Panama Lane
Bakersfield, CA 93307
Facility Contact Person: Gabe Castro
Contact Telephone: (661) 845-0761
Contact E-Mail: gcastro@kernenergy.com
Application #(s): S-37-178-0
Project #: S-1251187
Date Deemed Complete: May 29, 2025

Date: April 30, 2026
Engineer: Dan Klevann
Lead Engineer: Erin Scott

I. Proposal

Kern Energy (Kern) has requested an Authority to Construct (ATC) for a hydrogen recovery operation which includes using the hydrogen in one of seven permit exempt 3 MW fuel cells for onsite power generation or storing the hydrogen for future use. The draft ATC(s) are included in Appendix A.

Kern received their renewed Title V Permit on June 9, 2023. This modification can be classified as a Title V significant modification pursuant to Rule 2520, and can be processed with a Certificate of Conformity (COC). Since the facility has specifically requested that this project be processed in that manner, the 45-day EPA comment period will be satisfied prior to the issuance of the Authority to Construct. Kern must apply to administratively amend their Title V permit.

The District received public comments on this project and has made adjustments to this evaluation including typographical corrections and clarifications for transparency purposes. The District has also compiled the public comments along with District responses to the comments in Appendix M.

II. Applicable Rules

Rule 2201	New and Modified Stationary Source Review Rule (4/20/23)
Rule 2410	Prevention of Significant Deterioration (6/16/11)
Rule 2520	Federally Mandated Operating Permits (6/20/24)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4002	National Emissions Standards for Hazardous Air Pollutants (5/20/04)
Rule 4101	Visible Emissions (2/17/05)
Rule 4102	Nuisance (12/17/92)
Rule 4454	Refinery Process Unit Turnaround (12/17/92)
Rule 4455	Components at Petroleum Refineries, Gas Liquids Processing Facilities and Chemical Plants (6/15/2023)

CH&SC 41700 Health Risk Assessment

CH&SC 42301.6 School Notice

Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)

California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Project Location

The facility is located at 7724 East Panama Lane, Bakersfield, CA. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

IV. Process Description

Kern is engaged in the production of gasoline and various distillates, including diesel fuel. Kern is proposing to install a hydrogen recovery process unit to capture existing hydrogen already being co-produced in the process naphtha reformer and the platformer unit for use in the production of clean electricity to support the refinery power needs. A process flow diagram is shown in Appendix B.

The hydrogen system can operate in two different modes as described below:

- **Hydrogen Store & Release Mode:** Hydrogen produced in the reformers is purified in the hydrogen purification equipment of the hydrogen recovery process unit and chemically bound to toluene in a reactor through the hydrogenation process to generate methyl cyclohexane (MCH). The toluene and MCH will be stored in existing organic liquid storage tanks. Hydrogen from the MCH is released on-demand through the dehydrogenation process in a reactor to produce ultra-pure hydrogen that can then be used in the fuel cells to produce electricity or alternatively used to supplement facility operations, as needed. Any heat needs for the hydrogenation and dehydrogenation process are facilitated by refinery steam and heat exchangers.
- **Hydrogen Direct to Fuel Cell Mode:** Hydrogen produced in the reformers is supplied to the hydrogen purification equipment of the hydrogen recovery process unit, and then sent directly into the fuel cells for use in electricity production.

The new fuel cells are Purecell model 400 units. The fuel cells require H₂ for operation. Per the manufacturer (see Appendix B), the emissions from the fuel cells are zero emissions for NO_x, SO_x, CO, VOC. As the emissions are less than 2.0 lb/day for each pollutant, the fuel cells are permit exempt. For clarification purposes they will be listed on the new hydrogen recovery unit permit.

V. Equipment Listing

S-37-178-0: HYDROGEN RECOVERY UNIT CONSISTING OF HYDROGENATION, DEHYDROGENATION, AND HYDROGEN PURIFICATION EQUIPMENT INCLUDING REACTORS, COMPRESSORS, HEAT EXCHANGERS, PUMPS, MISCELLANEOUS VESSELS, AND 7 PERMIT EXEMPT HYDROGEN FUEL CELLS

VI. Emission Control Technology Evaluation

The Hydrogen Recovery Unit will be connected to the other equipment at the facility by way of piping. VOC emissions are expected to result from leaks in piping components (such as valves and flanges). While parts of the system will be in hydrogen service, the process will also have components expected to contain volatile organic compounds in excess of 10% by weight. The District will treat all new components as containing VOC. As such, components will be monitored and controlled in accordance with Rule 4455.

No changes to the components associated with the Naphtha Reformer Unit (S-37-119) or the Platformer Unit (S-37-4) is expected.

VII. General Calculations

A. Assumptions

The potential to emit from the new components associated with the hydrogen recovery project will be calculated using California Implementation Guidelines for Estimating Mass Emissions of fugitive Hydrocarbon Leaks at Petroleum Facilities, CAPCOA/CARB, February 1999. Applicant is proposing use of the correlation equation emission factors.

- Facility will operate 24 hours per day, 7 days per week, and 52 weeks per year.
- The fugitive emissions for all piping components are calculated using California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, CAPCOA/CARB, February 1999 correlation equation emission factors.
- Facility is limited by District Rule 4455 to less than 10,000 ppm for all components. Therefore, for pegged emissions value, 9,999 ppm will be used in the Correlation Equation to calculate the pegged value.

In accordance with District Policy SSP-2015, emissions have been estimated based on component counts and the emission factors from Table IV-3a (1995 EPA Correlation Equation Factors for Refineries and Marketing Terminals) of the “California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities,” issued by the California Air Pollution Control Officers Association (CAPCOA) and the California Air Resources Board (ARB) in February 1999. The correlation equation method requires data from Method 21 leak monitoring inspections on these components, to establish the % Default Zero, % Pegged, and % within Correlation range.

B. Emission Factors

The emission factors used to estimate fugitive VOC emissions from equipment leaks at piping components associated with this new system is from Table IV-3a of the “California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities” (February 1999). Minor leak thresholds are based on compliance with Rule 4455, effective 7/1/2024.

Emission factors are determined depending on whether the components are leak free, are at the correlation equation values or are pegged emissions. Kern has proposed the number of components that are at each level. These component counts are shown in Appendix C.

The correlation equation values are determined using the correlation equation and the lower of either the BACT ppm limit or the Rule 4455 ppm limit for each component type.

A sample equation is shown below for valves using the correlation equation at the 100 ppmv leak threshold value being used.

Valves:

$$\begin{aligned}\text{VOC} &= 2.27\text{E-}6 (\text{SV})^{0.747} \\ &= 2.27\text{E-}6 (100)^{0.747} \\ &= 0.000071 \text{ kg/hr per component} \\ &= 0.00375 \text{ lb/day per component}\end{aligned}$$

The pegged component values are determined using the correlation equation and a pegged ppm value of 9,999 for each component type.

A sample equation is shown below for using the correlation equation at the 9,999 ppmv leak threshold value being used as the pegged value as Rule 4455 does not allow leaks over 10,000 ppmv.

Valves:

$$\begin{aligned}\text{VOC} &= 2.27\text{E-}6 (\text{SV})^{0.747} \\ &= 2.27\text{E-}6 (9,999)^{0.747} \\ &= 0.002 \text{ kg/hr per component} \\ &= 0.117 \text{ lb/day per component}\end{aligned}$$

The emission factors for the components are provided below:

Equipment Type	Default Zero Factor*	Rule 4455 Minor Leak Threshold	BACT leak threshold	Correlation Equation*	Pegged Component*
	(lb/component per day)	(ppm)	(ppm)	(lb/component per day)	(lb/component per day)
Valves	0.000413	400	100	0.00375	0.117
Pump Seals	0.001005	500		0.128	0.825
Others	0.000212	500		0.0249	0.170
Connectors	0.000397	400	100	0.007	0.071
Flanges	0.000016	400	100	0.016	0.159
Open-Ended Lines	0.000106	500		0.00904	0.079

*These values have been rounded for display purposes

These values are multiplied by the number of components and the percentage in that range. Example for valves using the correlation equation:

$$0.00375 \times 251 \times 9.5\% = 0.089323$$

C. Calculations

1. Pre-Project Potential to Emit (PE1)

Since this is a new emissions unit, PE1 = 0 for all pollutants.

2. Post-Project Potential to Emit (PE2)

The post-project potential to emit calculations are presented in Appendix C and summarized in the table below. Post-project potential to emit (PE2) calculations are calculated based on the fugitive component count associated with the new unit, applying the correlation equation method for estimating emissions. The component count and associated emissions are shown in Appendix C.

PE2		
Pollutant	Daily Emissions (lb/day)	Annual Emissions (lb/year)
NOx	0	0
SOx	0	0
PM10	0	0
CO	0	0
VOC	1.3	483

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to District Rule 2201, the SSPE1 is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of Emission Reduction Credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions (AER) that have occurred at the source, and which have not been used on-site, including all ERCs held as certificates and all emission reduction credits sold or transferred.

The SSPE1 is calculated in Appendix G and presented in the following table.

SSPE1 (lb/year)					
	NOx	SOx	PM10	CO	VOC
SSPE1	122,606	66,206	39,995	335,489	268,814

4. Post-Project Stationary Source Potential to Emit (SSPE2)

Pursuant to District Rule 2201, the SSPE2 is the PE from all units with valid ATCs or PTOs at the Stationary Source, except for emissions units proposed to be shut down as part of a Stationary Source Project, and the quantity of ERCs which have been banked since September 19, 1991 for AER that have occurred at the source, and which have not been used on-site, including all ERCs held as certificates and all emission reduction credits sold or transferred.

The SSPE2 is calculated in Appendix H and presented in the following table.

SSPE2 (lb/year)					
	NOx	SOx	PM10	CO	VOC
SSPE2	122,606	66,206	39,995	335,489	269,297

5. Major Source Determination

Rule 2201 Major Source Determination:

Pursuant to District Rule 2201, a Major Source is a stationary source with a SSPE2 equal to or exceeding one or more of the following threshold values. For the purposes of determining major source status, the following shall NOT be included:

- any ERCs associated with the stationary source
- Emissions from non-road IC engines (i.e. IC engines at a particular site at the facility for less than 12 months), pursuant to the Clean Air Act, Title 3, Section 302, US Codes 7602(j) and (z)

- Fugitive emissions, except for the specific source categories specified in 40 CFR 51.165

This source is an existing Major Source for VOC emissions and will remain a Major Source for VOC. No change in other pollutants are proposed or expected as a result of this project.

Rule 2410 (Prevention of Significant Deterioration) Major Source Determination:

The facility or the equipment evaluated under this project is listed as one of the categories specified in 40 CFR 52.21 (b)(1)(iii). Therefore the PSD Major Source threshold is 100 tpy for any regulated NSR pollutant.

PSD Major Source Determination (tons/year)						
	NO ₂	VOC	SO ₂	CO	PM*	PM10
Estimated Facility PE before Project Increase	61	134	33	167	20	20
PSD Major Source Thresholds	100	100	100	100	100	100
PSD Major Source?	No	Yes	No	Yes	No	No

*PM assumed to be equal to PM10.

As shown above, the facility is an existing PSD major source for at least one pollutant.

6. Baseline Emissions (BE)

The BE calculation (in lb/year) is performed pollutant-by-pollutant for each unit within the project to calculate the Quarterly Net Emissions Change (QNEC), and if applicable, to determine the amount of offsets required.

Pursuant to District Rule 2201, BE = PE1 for:

- Any unit located at a non-Major Source,
- Any Highly-Utilized Emissions Unit, located at a Major Source,
- Any Fully-Offset Emissions Unit, located at a Major Source, or
- Any Clean Emissions Unit, located at a Major Source.

otherwise,

BE = Historic Actual Emissions (HAE), calculated pursuant to District Rule 2201.

S-37-178-0:

Since this is a new emissions unit, BE = PE1 = 0 for all pollutants.

7. Senate Bill 288 Major Modification

A Senate Bill (SB) 288 Major Modification is a federal major modification under 40 CFR 51.165 as it existed on December 19, 2002. 40 CFR Part 51.165 (12/19/02) defines a Major Modification as any physical change in or change in the method of operation of *an existing major stationary source* that would result in a significant net emissions increase of any pollutant subject to regulation under the Act.

Per section VII.C.5 above, this facility is a major source for VOC. Thus, the project's PE2 is compared to the SB 288 Major Modification Thresholds in the following table in order to determine if further SB 288 Major Modification calculation is required.

As calculated in Section VII above:

SB 288 Major Modification Thresholds			
Pollutant	Project PE2 (lb/year)	Threshold (lb/year)	SB 288 Major Modification Calculation Required?
NO _x	0	50,000	No
SO _x	0	80,000	No
PM ₁₀	0	30,000	No
VOC	483	50,000	No

Since none of the SB 288 Major Modification Thresholds are surpassed with this project, this project does not constitute an SB 288 Major Modification and no further discussion is required.

8. Federal Major Modification / New Major Source

Federal Major Modification

District Rule 2201 states that a Federal Major Modification is the same as a "Major Modification" as defined in 40 CFR 51.165 and part D of Title I of the CAA.

As defined in 40 CFR 51.165, Section (a)(1)(v) and part D of Title I of the CAA, a Federal Major Modification is any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act. The significant net emission increase threshold for each criteria pollutant is included in Rule 2201.

The determination of Federal Major Modification is based on a two-step test. For the first step, only the emission *increases* are counted. In step 1, emission decreases cannot cancel out the increases. Step 2 allows consideration of the project's net emissions increase as described in 40 CFR 51.165 and the Federal Clean Air Act Section 182 (e), as applicable.

Step 1: Project Emissions Increase

For new emissions units, the increase in emissions is equal to the PE2 for each new unit included in this project:

$$\text{Emission Increase} = \text{PE2}$$

In conclusion, the project's combined total emission increases are summarized in the following table and are compared to the Federal Major Modification Thresholds in the following table.

Federal Major Modification Thresholds for Emission Increases			
Pollutant	Total Emissions Increases (lb/yr)	Thresholds (lb/yr)	Federal Major Modification?
NOx*	0	0	No
VOC*	483	0	Yes
PM10	0	30,000	No
PM2.5	0	20,000	No
SOx	0	80,000	No

*If there is any emission increases in NOx or VOC, this project is a Federal Major Modification and no further analysis is required.

Since there is an increase in VOC emissions, this project constitutes a Federal Major Modification. Consequently, as discussed below in the offset section of this evaluation, pursuant to Section 4.8.1.1 of District Rule 2201, VOC internal emission reductions (IER) or other actual emission reductions (AERs) used to satisfy the offset quantity required under District Rule 2201 must be surplus at the time of use (ATC issuance). Separately, Federal Offset Quantity is calculated below.

New Major Source

As demonstrated above, this facility is not becoming a Major Source as a result of this project, therefore, this facility is not a New Major Source pursuant to Section 3.30 of District Rule 2201.

9. Rule 2410 – Prevention of Significant Deterioration (PSD) Applicability Determination

Rule 2410 applies to any pollutant regulated under the Clean Air Act, except those for which the District has been classified nonattainment. The pollutants which must be addressed in the PSD applicability determination are listed in CFR 52.21 (b) (23). This project only affects VOC emissions which do not require a PSD evaluation per CFR 52.21(b)(23). No further discussion is required.

10. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. Detailed QNEC calculations are included in Appendix I.

VIII. Compliance Determination

The Compliance Section shall document compliance with District Rules. List and discuss every relevant applicable rule. Discuss the basis for every condition that will be added to, modified or removed from the permit.

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

Pursuant to District Rule 2201, Section 4.1, BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless specifically exempted by Rule 2201, BACT shall be required for the following actions*:

- a. Any new emissions unit with a potential to emit exceeding 2.0 pounds per day, or the relocation from one Stationary Source to another of an existing emissions unit with a potential to emit exceeding 2.0 pounds per day,
- b. Modifications to an existing emissions unit with a valid Permit to Operate resulting in an Adjusted Increase in Permitted Emissions (AIPE) exceeding 2.0 pounds per day, and/or
- c. Any new or modified emissions unit, in a stationary source project, which results in an SB 288 Major Modification or a Federal Major Modification, as defined by the rule.

*Except for CO emissions from a new or modified emissions unit at a Stationary Source with an SSPE2 of less than 200,000 pounds per year of CO.

a. New or relocated emissions units – PE > 2.0 lb/day

As seen in Section VII.C.2 above, the applicant is proposing to install a hydrogen recovery operation with a PE less than 2.0 lb/day for VOC. Therefore, BACT is not triggered for VOC since the PE are not greater than 2.0 lb/day.

b. Modification of emissions units – AIPE > 2.0 lb/day

As discussed in Section I above, there are no modified emissions units associated with this project. Therefore BACT is not triggered.

c. SB 288/Federal Major Modification

As discussed in Sections VII.C.7 and VII.C.8 above, this project does constitute an SB 288 and/or Federal Major Modification for VOC emissions. Therefore, BACT is triggered for VOC for all emissions units in the project for which there is an emission increase.

2. BACT Guideline

BACT Guideline 7.2.2 (Petroleum Refining – Valves & Connectors) and BACT Guideline 7.2.3 (Petroleum Refining – Pump and Compressor Seals), applies to the hydrogen recovery operation. (See Appendix D).

3. Top-Down BACT Analysis

Per Permit Services Policies and Procedures for BACT, a Top-Down BACT analysis shall be performed as a part of the application review for each application subject to the BACT requirements pursuant to the District's NSR Rule.

Pursuant to the attached Top-Down BACT Analysis (see Appendix E), BACT has been satisfied with the following component types:

Valves and Connectors:

Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 100 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4455.

Pumps and compressor seals:

Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 500 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4455.

B. Offsets

1. District Emission Offset Requirements

a. District Offset Applicability

Pursuant to District Rule 2201, Section 4.5, District offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the SSPE2 equals or exceeds the offset threshold levels in Table 4-1 of District Rule 2201.

The SSPE2 is compared to the offset thresholds in the following table.

District Offset Determination (lb/year)					
	NO _x	SO _x	PM ₁₀	CO	VOC
SSPE2	122,606	66,206	39,995	335,489	269,297
Offset Thresholds	20,000	54,750	29,200	200,000	20,000
Offsets Triggered?	Yes	Yes	Yes	Yes	Yes

b. District Offset Quantity (DOQ) Required

As shown above, the SSPE2 is greater than the offset thresholds for NO_x, SO_x, PM₁₀, CO and VOC; therefore, District offsets are triggered for NO_x, SO_x, PM₁₀, CO and VOC under NSR. However, this project only has an increase in VOC emissions so the other pollutants will not be considered. Also, since this project is a Federal Major Modification or New Major Source for VOC, the District offset exemption from Section 4.6.10 and 4.6.11 of District Rule 2201 is applicable to this project, and District offsets for VOC are not required.

2. Federal Emission Offset Requirements

a. Federal Offset Applicability

Pursuant to District Rule 2201, Section 4.8, federal offset requirements shall be triggered on a pollutant by pollutant basis and shall be required if the project is a New Major Source or a Federal Major Modification.

As demonstrated in section VII.C.8 above, this project is a Federal Major Modification for VOC. Thus, federal offsets are triggered for this project.

b. Federal Offset Quantity (FOQ) Required

The District is designated as Extreme non-attainment for ozone (NO_x and VOC emissions). As discussed above, the proposed project is to install a hydrogen recovery unit to provide hydrogen for power production and other refinery usage.

The Federal Offset Quantity (FOQ) is only calculated for the pollutants for which a project is a Federal Major Modification or a New Major Source as determined above.

Pursuant to Section 4.8.4 of District Rule 2201, the federal offset quantity is the sum of the annual emission changes for all new and modified emission units in a project calculated as the potential to emit after the modification (PE2) minus the federal baseline emissions (FBE) for each emission unit times the applicable offset ratio.

$$\text{FOQ} = \sum (\text{PE2} - \text{FBE}) \times \text{offset ratio}$$

Federal Baseline Emissions

Pursuant to Section 3.19 of District Rule 2201, for a given pollutant, federal baseline emissions (FBE) = PE1 for:

- Any Highly-Utilized Emissions Unit,
- Any Fully-Offset Emissions Unit.

otherwise,

FBE = Historic Actual Emissions (HAE), calculated pursuant to District Rule 2201.

Since this is a new unit, FBE = 0

Federal Offset Quantity (FOQ)

Since this project only includes new unit(s)

FOQ = PE2 x offset ratio

VOC		Offset Ratio	1.5
Permit No.	Post-Project Potential to Emit (PE2) (lb/year)	Federal Baseline Emissions (lb/year)	Emissions Change (lb/yr)
S-37-178-0	483	0	483
$\sum(PE2 - FBE) \text{ (lb/year):}$			483
Federal Offset Quantity (lb/year): $\sum(PE2 - FBE) \times 1.5$			725
Federal Offset Quantity (tons/year): $\sum(PE2 - FBE) \times 1.5 \div 2,000$			0.4

3. Federal Offset Equivalency Demonstration

Section 7.0 of District Rule 2201 provides the requirements for the District to demonstrate on an individual ATC issuance basis that the number of creditable emission reductions collected by the District equals or exceeds the amount of creditable emission reductions that would otherwise be required as offsets under a federal non-attainment NSR program meeting the applicable requirements of 40 CFR 51.165 and the CAA.

As discussed above, this project triggers a Federal Major Modification for VOC, and federal offset quantities are required for this project for VOC. Pursuant to section 4.8.1.1 of District Rule 2201, actual emission reductions used to satisfy federal offset quantities for VOC must be creditable and surplus at the time of use (ATC issuance).

Surplus at the Time Of Use Emission Reduction Credits

The applicant has stated that the facility plans to use ERC certificate C-1579-1 to satisfy the federal offset quantities for VOC required for this project. Pursuant to the ERC surplus analysis in Appendix K, the District has verified that the surplus credits from the ERC certificate provided by the applicant are sufficient to satisfy the federal offset quantities for VOC required for this project.

Therefore the appropriate quarterly emissions to be offset are summarized as follows:

Federal Offset Quantity (FOQ) Required (lbs)					
Pollutant	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Total Annual
VOC	181	181	181	182	725

The applicant has proposed to use the following emission reduction certificates with the surplus value of credits summarized as follows:

Surplus VOC Credits Provided (lbs)					
ERC #	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Total Annual
C-1579-1	2,000	2,000	2,000	2,000	8,000

As discussed above, the facility has sufficient credits to fully offset the VOC emissions increases associated with this project.

Proposed Rule 2201 Federal Offset Permit Conditions

The following permit conditions will be added to the Authority(ies) to Construct:

- {GC# 4447 - edited} Prior to operating equipment under this Authority to Construct, permittee shall surrender VOC emission reduction credits for the following quantity of emissions: 1st quarter - 181 lb, 2nd quarter - 181 lb, 3rd quarter - 181 lb, and fourth quarter - 182 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.9 (as amended 4/20/23) for the ERC specified below. VOC ERCs used to satisfy the offset quantity required under District Rule 2201 must be surplus at the time of issuance of this ATC and the total quantity of ERCs surrendered shall be calculated based on the ERC surplus value percent discount of each ERC certificate used. [District Rule 2201]

- {GC# 1983} ERC Certificate Number C-1579-1 (or a certificate split from this certificate) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201]

4. ERC Withdrawal Calculations

The applicant must identify the ERC Certificate(s) to be used to offset the increase of VOC emissions for the project. As previously indicated, the applicant is proposing to use ERC certificate #C-1579-1 to mitigate the increases of VOC emissions associated with this project. See Appendix L for detailed ERC Withdrawal Calculations.

C. Public Notification

1. Applicability

Pursuant to District Rule 2201, Section 5.4, public noticing is required for:

- a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications,
- b. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
- c. Any project which results in the offset thresholds being surpassed,
- d. Any project with an SSPE of greater than 20,000 lb/year for any pollutant,
- e. Any project at a minor source which results in an SSPE exceeding 80% of the major source threshold for any pollutant, and/or
- f. Any project which results in a Title V significant permit modification

a. New Major Sources, Federal Major Modifications, and SB 288 Major Modifications

As demonstrated in Section VII.C.7 of this evaluation, this project is a Federal Major Modification. Therefore, public noticing is required for this project for Federal Major Modification purposes.

b. PE > 100 lb/day

Applications which include a new emissions unit with a PE greater than 100 pounds during any one day for any pollutant will trigger public noticing requirements. As seen in Section VII.C.2 above, this project does not include a new emissions unit which has daily emissions greater than 100 lb/day for any pollutant, therefore public noticing for PE > 100 lb/day purposes is not required.

c. Offset Threshold

Public notification is required if the pre-project Stationary Source Potential to Emit (SSPE1) is increased to a level exceeding the offset threshold levels. The following table compares the SSPE1 with the SSPE2 in order to determine if any offset thresholds have been surpassed with this project.

Offset Thresholds (lb/year)					
	NOx	SOx	PM10	CO	VOC
SSPE1	122,606	66,206	39,995	335,489	268,814
SSPE2	122,606	66,206	39,995	335,489	269,297
Offset Threshold	20,000	54,750	29,200	200,000	20,000
Public Notice Required?	No	No	No	No	No

As demonstrated above, there were no thresholds surpassed with this project; therefore public noticing is not required for offset purposes.

d. SSIPE > 20,000 lb/year

Public notification is required for any permitting action that results in a SSIPE of more than 20,000 lb/year of any affected pollutant. According to District Rule 2201, the SSIPE = SSPE2 – SSPE1. The SSIPE is compared to the SSIPE Public Notice thresholds in the following table.

SSIPE Public Notice Thresholds (lb/year)					
	NOx	SOx	PM10	CO	VOC
SSPE2	122,606	66,206	39,995	335,489	269,297
SSPE1	122,606	66,206	39,995	335,489	268,814
SSIPE	0	0	0	0	483
SSIPE Public Notice Threshold	20,000	20,000	20,000	20,000	20,000
Public Notice Required?	No	No	No	No	No

As demonstrated above, the SSIPEs for all pollutants were less than 20,000 lb/year; therefore public noticing for SSIPE purposes is not required.

e. Minor Sources with SSPE Exceeding 80% of Major Source Threshold

Public notification is required for any project for new and/or modified stationary sources at minor source facilities that results in a SSPE exceeding 80% of the major source threshold.

As seen in Section VII.C.5, since the facility is a Major Source for all pollutants emitted by this project, public noticing for this purpose is not required.

f. Title V Significant Permit Modification

As shown in the Discussion of Rule 2520 below, this project constitutes a Title V significant modification. Therefore, public noticing for Title V significant modifications is required for this project.

2. Public Notice Action

As discussed above, public noticing is required for this project for being a Federal Major Modification. Therefore, public notice documents will be submitted to the California Air Resources Board (CARB) and a public notice will be electronically published on the District's website prior to the issuance of the ATC for this equipment.

D. Daily Emission Limits (DELs)

DELs and other enforceable conditions are required by Rule 2201 to restrict a unit's maximum daily emissions, to a level at or below the emissions associated with the maximum design capacity. The DEL must be contained in the latest ATC and contained in or enforced by the latest PTO and enforceable, in a practicable manner, on a daily basis. DELs are also required to enforce the applicability of BACT.

DELs for the emission units in this project will be included on the ATCs in the form of fugitive component emissions limits in lb VOC/day. The permittee will be required to maintain accurate records of fugitive component counts and resulting emission calculations to validate the DEL.

Proposed Rule 2201 (DEL) Conditions:

- VOC emission rate from fugitive components associated with this emissions unit shall not exceed 1.3 lb/day [District Rule 2201]

E. Compliance Assurance

1. Source Testing

Pursuant to District Policy APR 1705, source testing is not required to demonstrate compliance with Rule 2201.

2. Monitoring

Kern currently has a fugitive emission monitoring program in place. The new fugitive components will be monitored under the same program.

3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201. The following condition(s) are listed on the permit to operate:

- Permit holder shall maintain accurate component count and resultant emissions from the components associated with this permit according to California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, CAPCOA/CARB Table IV-3a: CAPCOA -Revised 1995 EPA Protocol Refinery Correlation Equations. Permit holder shall update such records when new components are approved and installed. [District Rule 2201]

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis (AAQA)

Section 4.15 of District Rule 2201 requires that an AAQA be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an air quality standard. Although an ambient air quality analysis (AAQA) was requested, the only emissions associated with the project are VOC emissions. There are currently no ambient air quality standards for VOCs, therefore, an AAQA was not performed.

G. Alternate Siting Analysis

The current project occurs at an existing facility. The applicant proposes to install a hydrogen recovery and hydrogen power generation operation.

Since the project recovers hydrogen from the refinery processes to be used at the same location, the existing site will result in the least possible impact from the project. Alternative sites would involve the relocation and/or construction of various support structures on a much greater scale, and would therefore result in a much greater impact.

H. Compliance Certification

Section 4.16.2 of this Rule requires the owner of a New Major Source or a source undergoing a Federal Major Modification to demonstrate to the satisfaction of the District that all other Major Sources owned by such person and operating in California are in compliance or are on a schedule for compliance with all applicable emission limitations and standards. As discussed in Section VIII above, this project does constitute a Federal Major Modification, therefore this requirement is applicable. Kern's compliance certification is included in Appendix J. The District reviewed the facility's compliance status as part of this project and found that the facility is currently in compliance with all applicable emission limitations and standards, i.e., there are no existing uncorrected Notices of Violation.

I. Visibility Impact Analysis

Section 4.16.3 of District Rule 2201 requires the District, in consultation with the designated Federal Land Manager (FLM), to assess the impact of the emissions from New Major Sources and Federal Major Modifications to visibility in the nearest or most affected Mandatory Class I Federal Area (MCFA). As shown in Section VII.C.8 above, this project is a Federal Major Modification for VOC; therefore, a visibility impact assessment under Section 4.16.3 is required. A visibility impact assessment evaluates the impact to visibility from a project's total NO_x, SO_x, PM₁₀, and sulfuric acid mist emissions to the nearest or most affected MCFA. However, since this project is not a source of NO_x, SO_x, PM₁₀, or sulfuric acid mist emissions, this project is presumed to have no adverse impact on visibility at any MCFA, and no further analysis is required.

Rule 2410 Prevention of Significant Deterioration

As shown in Section VII.C.9 above, this project does not result in a new PSD major source or PSD major modification. No further discussion is required.

Rule 2520 Federally Mandated Operating Permits

This facility is subject to this Rule, and has received their Title V Operating Permit. A significant permit modification is defined as a “permit amendment that does not qualify as a minor permit modification or administrative amendment.”

Section 3.21.5 states that a minor permit modification is a permit modification that is not a major modification, as defined in Rule 2201. As discussed above, this project triggers a Federal Major Modification. As a result, the proposed project constitutes a Significant Modification to the Title V Permit pursuant to Section 3.30.

As discussed above, the facility has applied for a Certificate of Conformity (COC); therefore, the facility must apply to modify their Title V permit with an administrative amendment, prior to operating with the proposed modifications. Continued compliance with this rule is expected. The facility shall not implement the changes requested until the final permit is issued.

Rule 4001 New Source Performance Standards (NSPS)

This rule incorporates NSPS from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR); and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in 40 CFR Part 60.

40 CFR Part 60, Subpart GGG - Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced after January 4, 1983, and on or Before November 7, 2006

Kern has an inspection and repair program for the components at the refinery. The program is in compliance with subpart GGG. Note, this project is not subject to this subpart as it will be constructed after the applicable dates.

40 CFR Part 60 Subpart GGGa - Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After November 7, 2006.

Kern Energy does have equipment subject to this Subpart, and has an inspection and repair program for the components at the refinery. The program is in compliance with subpart GGGa. However, this project is not subject to this subpart as it is not an affected facility as the proposed equipment does not meet the definition of a process unit.

Process unit means components assembled to produce intermediate or final products from petroleum, unfinished petroleum derivatives, or other intermediates; a process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product.

Rule 4002 National Emission Standards for Hazardous Air Pollutants (NESHAPs)**40 CFR 63 Subpart CC - National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries**

This subpart applies to petroleum refining process units and to related emissions points that are specified in paragraphs (c)(1) through (9) of this section that are located at a plant site that: (1) are located at a plant site that is a major source as defined in section 112(a) of the Clean Air Act; and (2) emit or have equipment containing or contacting one or more of the hazardous air pollutants listed in table 1 of this subpart.

A major source is a facility that emits or has the potential to emit any single HAP at a rate of 10 tons or more per year or any combination of HAP at a rate of 25 tons or more per year. Kern is not a major source of HAP, and the facility's total stationary source HAP emissions are limited by a permit condition of the facilitywide permit S-37-0 to 10 tons in any consecutive 12 month period any HAP (as defined in 40 CFR 63.2) and 25 tons in any consecutive 12 month period of any combination of HAPs. Therefore, the facility is not subject to the requirements of this rule.

Rule 4101 Visible Emissions

Rule 4101 states that no person shall discharge into the atmosphere emissions of any air contaminant aggregating more than 3 minutes in any hour which is as dark as or darker than Ringelmann 1 (or 20% opacity). Visible emissions are not expected from the hydrogen power generation equipment or its fugitive components. Therefore, compliance with this rule is expected.

Rule 4102 Nuisance

Rule 4102 prohibits discharge of air contaminants which could cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations, provided the equipment is well maintained. Therefore, compliance with this rule is expected.

California Health & Safety Code 41700 (Health Risk Assessment (HRA))

District Policy APR 1905 – *Risk Management Policy for Permitting New and Modified Sources* specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

District policy APR 1905 also specifies that the increase in emissions associated with a proposed new source or modification of an existing source shall not result in an increase in cancer risk greater than the District's significance level (20 in a million) and shall not result in acute and/or chronic risk indices greater than 1.

An HRA is not required for a project with a total facility prioritization score of less than or equal to one. According to the Technical Services Memo for this project, the total facility

prioritization score including this project was greater than or equal to one; therefore an HRA is required.

The resulting prioritization score for this project and facility is shown below.

Health Risk Assessment Summary	
	Worst Case Potential
Project Prioritization Score	0.003
Facility Prioritization Score	> 1

In accordance with District policy APR 1905, and based on the HRA, the project is approvable since the facility's cumulative acute and chronic indices and the cumulative cancer risk are below all significance thresholds; therefore, no further analysis is required to determine the impact from this project and compliance with the District's Risk Management Policy is expected.

Compliance with District Rule 4102 requirements is expected.

See Appendix F: Health Risk Assessment Summary

Discussion of T-BACT

BACT for toxic emission control (T-BACT) is required if the cancer risk exceeds one in one million. T-BACT is not required for this project because the HRA indicates that the worst case cancer risk does not exceed one in one million; therefore, compliance with the District's Risk Management Policy is expected.

In accordance with District policy APR 1905, no further analysis is required, and compliance with District Rule 4102 requirements is expected.

See Appendix F: Health Risk Assessment Summary

Rule 4454 Refinery Process Unit Turnaround

The purpose of this rule is to limit VOC emissions from the purging, repair, cleaning, or otherwise opening or releasing pressure from a refinery vessel during a process unit turnaround. This rule applies to any refinery vessel that contains VOC.

This rule requires process vessels to be vented through a control device or otherwise controlled through incineration when depressurized for maintenance or repair. Conditions have been previously included on the permit to ensure the provisions of this rule are followed during such operations. Continued compliance is expected.

Rule 4455 Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants

The purpose of this rule is to limit Volatile Organic Compound (VOC) emissions from leaking components at petroleum refineries, gas liquids processing facilities, and chemical plants. This rule shall apply to components containing or contacting VOC at petroleum refineries, gas liquids processing facilities, and chemical plants.

The operator has implemented an operator management plan for the refinery for the current roster of components in VOC service. As required by this rule, the operator management plan submitted by the permittee was reviewed and approved by the District. The essential requirement of the rule is that an operator not use any component that leaks in excess of the applicable leak criteria established by the rule, with the exception that leaking components may be used provided that they are identified with a tag for repair, are repaired, or are awaiting re-inspection after being repaired, within the applicable time period specified in this rule. Minor and major gas and liquid leaks are defined and leak standards are established for the following component types: flanges, valves, threaded connections, pumps, compressor, pressure relief devices, pipes and other. The rule establishes inspection, re-inspection and maintenance requirements for components.

Condition 11 of the draft ATC references facility wide permit conditions (S-37-0-4 conditions 102 through 136) that will ensure continued compliance with the rule.

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

California Environmental Quality Act (CEQA)

The County of Kern (County) acted as CEQA Lead Agency for the Project. The County issued Site Plan Review approval and filed a Notice of Exemption (NOE) pursuant to CEQA Guidelines §15062 identifying exemptions under Public Resources Code §21080(b)(1) and CEQA Guidelines §15268 (ministerial approvals) and §15301 (Existing Facilities).

The San Joaquin Valley Air Pollution Control District (District), has conducted a Preliminary Review pursuant to CEQA Guidelines §15060, and has determined that the Project is a discretionary project as defined under CEQA Guidelines §15357. In addition to the exemptions identified in the County's NOE, the administrative record supports applicability of: (a) CEQA Guidelines §15302, because equipment will be installed within the existing refinery to serve the same operational purpose with no expansion of overall capacity; (b) CEQA Guidelines §15303, because the Project installs discrete specialized mechanical/process equipment within an existing industrial facility without altering the underlying use; and (c) CEQA Guidelines §15061(b)(3), because the Project is entirely within the existing industrial footprint, does not expand the refinery's footprint or introduce a new industrial use, and, based on the record, will not result in significant environmental effects.

Substantial evidence demonstrates the Project: (i) occurs entirely within the existing refinery boundary with no site expansion; (ii) involves limited construction (foundations, piles, delivery and placement of seven pre-assembled fuel cell units and two skid-mounted systems) with minimal earthwork; (iii) has no transportation impact because existing on-site generated hydrogen is used on-site, and involves only temporary delivery trucking trips; and (iv) has no adverse water resource impacts and may reduce net groundwater demand through fuel-cell water production and reuse.

The exception for unusual circumstances (CEQA Guidelines §15300.2(c)) does not apply because the Project consists of routine equipment installation and process improvements within an existing industrial facility, without footprint expansion, and is subject to District permitting controls; there is no reasonable possibility of significant environmental effects due to unusual circumstances.

The District has independently reviewed the County's NOE and the Project record, as well as conducted its own Preliminary Review, and found no basis for additional CEQA review for the District's discretionary ATC action. Public notice for this ATC has been provided consistent with District Rule 2201 and Title V procedures; such noticing is independent of CEQA noticing and does not alter the District's reliance on the County's NOE, nor on the District's own Preliminary Review which has supports the applicability of the exemptions identified herein.

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Pending a successful NSR Public Noticing period, issue ATC S-37-178-0 subject to the permit conditions on the attached draft ATC in Appendix A.

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
S-37-178-0	3020-06	miscellaneous	\$139

XI. Appendices

- A: Draft ATC
- B: Process Flow Diagram
- C: Calculations
- D: BACT Guideline
- E: BACT Analysis
- F: HRA Summary
- G: SSPE1 Calculations
- H: SSPE2 Calculations
- I: Quarterly Net Emissions Change
- J: Compliance Certification
- K: ERC Surplus Determination
- L: ERC Withdrawal Calculations
- M: Public Comments and District Responses

APPENDIX A

Draft ATC



AUTHORITY TO CONSTRUCT

ISSUANCE DATE: DRAFT

PERMIT NO: S-37-178-0

LEGAL OWNER OR OPERATOR: KERN ENERGY
MAILING ADDRESS: 7724 E PANAMA LN
BAKERSFIELD, CA 93307-9210

LOCATION: PANAMA LN & WEEDPATCH HWY
BAKERSFIELD, CA 93307-9210

SECTION: 25 **TOWNSHIP:** 30S **RANGE:** 28E

EQUIPMENT DESCRIPTION:

HYDROGEN RECOVERY UNIT CONSISTING OF HYDROGENATION, DEHYDROGENATION, AND HYDROGEN PURIFICATION EQUIPMENT INCLUDING REACTORS, COMPRESSORS, HEAT EXCHANGERS, PUMPS, MISCELLANEOUS VESSELS, AND 7 PERMIT EXEMPT HYDROGEN FUEL CELLS

CONDITIONS

1. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
2. {1831} Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] Federally Enforceable Through Title V Permit
3. Prior to operating equipment under this Authority to Construct, permittee shall surrender VOC emission reduction credits for the following quantity of emissions: 1st quarter - 181 lb, 2nd quarter - 181 lb, 3rd quarter - 181 lb, and fourth quarter - 182 lb. These amounts include the applicable offset ratio specified in Rule 2201 Section 4.9 (as amended 4/20/23) for the ERC specified below. VOC ERCs used to satisfy the offset quantity required under District Rule 2201 must be surplus at the time of issuance of this ATC and the total quantity of ERCs surrendered shall be calculated based on the ERC surplus value percent discount of each ERC certificate used. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 392-5500 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Samir Sheikh, Executive Director / APCO

Brian Clements, Director of Permit Services

S-37-178-0 : 4/29/2026 9:31:32 AM -- KLEVANNND : Joint Inspection NOT Required

PEXH 000195

4. ERC Certificate Number C-1579-1 (or a certificate split from this certificate) shall be used to supply the required offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit
5. VOC emission rate from fugitive components associated with this emissions unit shall not exceed 1.3 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit
6. For valves, flanges and connectors, a leak is defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 100 ppmv above background when measured per EPA Method 21. [District Rule 2201] Federally Enforceable Through Title V Permit
7. For pumps and compressor seals a leak is defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 500 ppmv above background when measured per EPA Method 21. [District Rule 2201] Federally Enforceable Through Title V Permit
8. {520} The operator shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rule 2520, 9.5.2] Federally Enforceable Through Title V Permit
9. Permit holder shall maintain accurate component count and resultant emissions according to California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, CAPCOA/CARB Table IV-3a: CAPCOA -Revised 1995 EPA Protocol Refinery Correlation Equations. Permit holder shall update such records when new components are approved and installed. [District Rule 2201] Federally Enforceable Through Title V Permit
10. This unit is subject to Rule 4455 Leak Detection and Repair Conditions on the facility wide permit S-37-0. [District Rule 4455] Federally Enforceable Through Title V Permit
11. Permittee shall comply with all applicable testing, recordkeeping, and reporting requirements specified in Rule 4001 - New Source Performance Standards, including but not limited to Subpart A. [District Rule 4001] Federally Enforceable Through Title V Permit
12. Operators shall not depressurize any vessel containing VOCs unless the process unit turnaround is accomplished by employing one of the following operating procedures: The organic vapors shall either be recovered, added to the refinery fuel gas system and combusted; or controlled and piped to an appropriate firebox or incinerated for combustion; or flared, until the pressure within the process vessel is as close to atmospheric pressure as is possible. All process vessels shall be depressurized into the control facilities to less than 1020 mm Hg (5 psig) before venting/opening to atmosphere. All organic compounds which emerge from a refinery process vessel during the purging of said vessel and which otherwise would be emitted to the atmosphere shall be either directed to a flare or incinerator or shall be used for fuel until such disposition of emissions is not technically feasible or is less safe than atmospheric venting. [District Rule 4454] Federally Enforceable Through Title V Permit

DRAFT

PEXH 000196

APPENDIX B

Process Flow Diagram

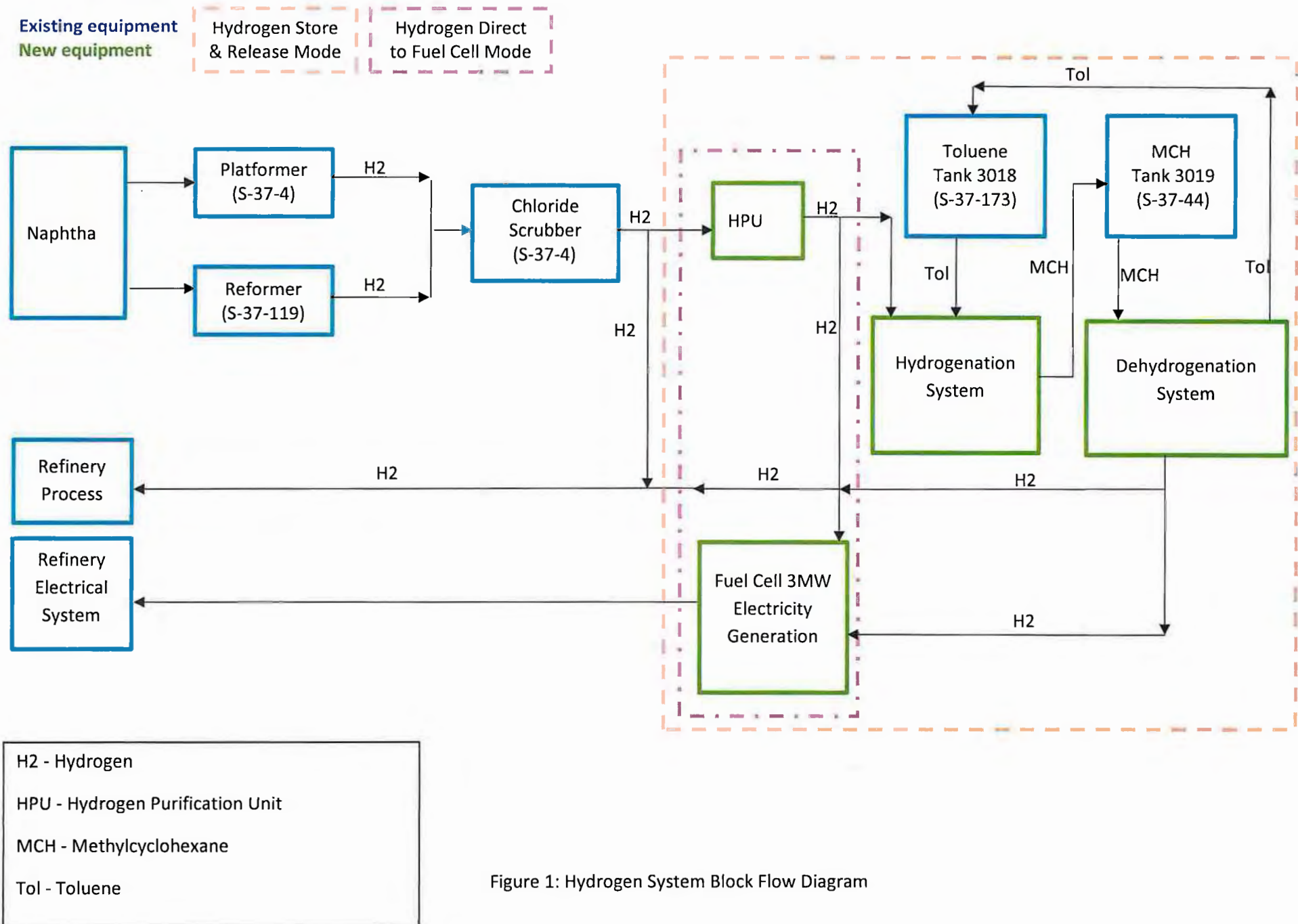


Figure 1: Hydrogen System Block Flow Diagram

PURECELL SYSTEM BENEFITS

Energy Security

Proven PAFC fuel cell technology that is setting durability records

Energy Productivity

Increased efficiency and continuous on-site generation reduces energy costs

Energy Responsibility

No emissions equals sustainability

PURECELL SYSTEM COMPETITIVE ADVANTAGES

Long Life

Industry leading 10-year cell stack life assures high availability and low service cost

Modular & Scalable

Solutions for multi-megawatt applications to meet growing energy demand

Experience

60+ years of fuel cell development

High Efficiency

Up to 90% total CHP Efficiency

Small Footprint

Highest power density among clean generation technologies

Flexible Siting

Indoor, outdoor, rooftop, multi-unit

RATED POWER OUTPUT: 440KW, 480VAC, 60HZ

Characteristic	Units	Value ¹
Electric Power Output	kW/kVA	440/517
Electrical Efficiency	%, LHV	50
Peak Overall Efficiency	%, LHV	90
Hydrogen Purity, Minimum ²	%	99.9
Hydrogen Input	Energy kW (MMBtu/h), HHV	1,039 (3.59)
	Volume ³ Nm ³ /h (SCFH)	295 (10,328)
	Mass kg/h (lbs/h)	26.4 (58.1)
Heat Output @ up to 121°C (250°F)	kW (MMBtu/h)	352 (1.20)

FUEL

Supply..... Hydrogen Gas
Inlet Pressure⁴ 5 ± 0.25 bar(g)

EMISSIONS

Zero emissions of CO₂, NO_x, SO_x, CO, and VOCs. Heat output can offset additional CO₂ from combustion heat generation (e.g., boilers).

OTHER

Ambient Operating Temp Max Power -20°F to 104°F (-29°C to 40°C)⁵
Sound Level < 65 dBA @ 33 ft. (10m)
Water Consumption None



Daesan Green Energy Project
50 MW | 114 Units | South Korea

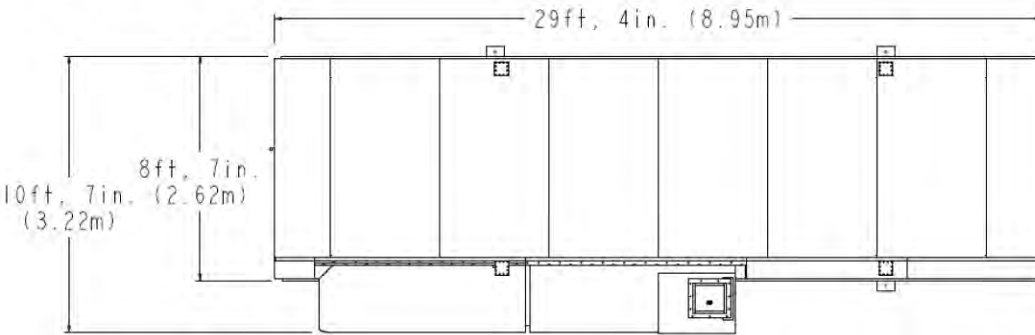
NOTES

1. Average performance during 1st year of operation. Refer to the Product Data and Applications Guide for performance over the operating life of the powerplant.
2. Contact HyAxiom for requirements on other gas constituents or for lower purity H₂.
3. Based on Hydrogen gas higher heating value of 343 Btu / SCF (12.8 MJ/Nm³).
4. Contact HyAxiom for lower inlet pressures.
5. Derate at ambient temperatures outside of specified range. Contact HyAxiom for details.

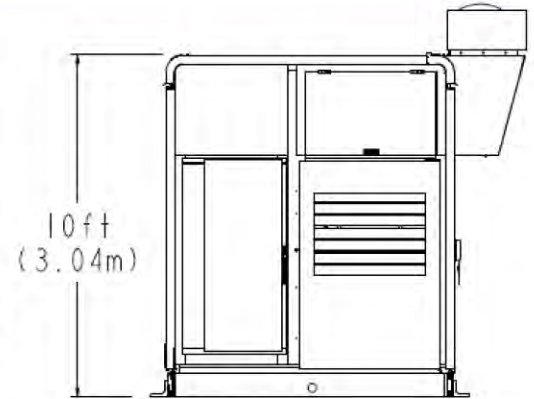
HyAxiom, Inc.
Corporate Headquarters
101 East River Drive
East Hartford, CT 06108
860.727.2253
www.hyaxiom.com

SYSTEM DIMENSIONS

Power Module

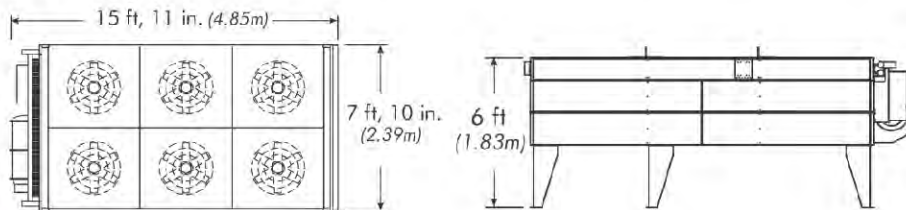


Top View

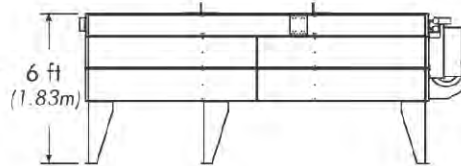


Side View

Cooling Module



Top View



Side View

PHYSICAL SPECIFICATIONS

	Power Module	Cooling Module
Length	29' 4" (8.95m)	15' 11" (4.85m)
Width	8' 7" (2.62m)	7' 10" (2.39m)
Height	10' 0" (3.04m)	6' 0" (1.83m)
Weight	49,428 lb (22,420 kg)	3,190 lb (1,447 kg)

Typical outdoor applications require a 30' x 40' area, including for customer interface equipment. Larger installations typically require less area for subsequent units.

PureCell® ADVANTAGE

Take Control of Your Power



Load Following

Dynamically ramp power up & down based on demand



Continuous Operation

Operate with or without grid power and handle long-duration intermittency



Performance Monitoring

Manage performance with HyAxiom monitoring and service

Advance ESG Goals



Zero-Carbon

Zero CO₂ emissions helps you achieve challenging carbon footprint goals



Clean Heat

Eliminate or reduce carbon from combustion boilers by using both heat & power



Clean Air

- Zero NO_x & SO_x
- Zero CO
- Zero VOCs

Power Where You Need It



Flexible Siting

- Indoor / Outdoor
- Urban Environments
- Multi-story, Rooftop
- Scalable Building Block



Quiet Operation

65 dBA @ 33 ft., equivalent to normal conversation

HyAxiom, Inc.
Corporate Headquarters
101 East River Drive
East Hartford, CT 06108
860.727.2253
www.hyaxiom.com

APPENDIX C

Calculations

Kern Energy
S-1251187, Permit Unit S-37-178-0

Using 9,999 pegged values

Fugitive Emissions Using Correlation Equation Emission Factors

California Implementation Guidelines for Estimating Mass Emissions
of Fugitive Hydrocarbon Leaks at Petroleum Facilities

Table IV-3a: CAPCOA -Revised 1995 EPA Protocol Refinery Correlation Equations for Refineries and Marketing Terminals

Fields shaded yellow are application specific values.

Equipment Type	Service	Component Count	% Default Zeros	%Pegged (>9,999)	% in Correlation Range	Correlation Screening Value (ppm)	Default Zero Emissions (lb/day)	Pegged Emissions (lb/day)	Correlation Emissions (lb/day)	VOC emissions (lb/day)
Valves	All	251	90.0%	0.5%	9.5%	100	0.093229	0.146615	0.089323	0.33
Pump Seals	All	6	90.0%	0.5%	9.5%	500	0.005429	0.024754	0.072977	0.10
Others	All	36	90.0%	0.5%	9.5%	500	0.006857	0.030606	0.084982	0.12
Connectors	All	120	90.0%	0.5%	9.5%	100	0.042857	0.042693	0.027361	0.11
Flanges	All	467	90.0%	0.5%	9.5%	100	0.006894	0.373160	0.274587	0.65
Open-ended lines	All	0	90.0%	0.5%	9.5%	500	0.000000	0.000000	0.000000	0.00

Total VOC Emissions (lb/day) = 1.3
Total VOC Emissions (lb/yr) = 483

Factors Used in Calculations - For Reference				
Equipment Type	Service	Default Zero Factor (kg/hr)	Pegged Factor (kg/hr)	Correlation Equation (kg/hr)
Valves	All	7.800E-06	2.208E-03	2.27E-06(SV)^0.747
Pump Seals	All	1.900E-05	1.559E-02	5.07E-05(SV)^0.622
Others	All	4.000E-06	3.214E-03	8.69E-06(SV)^0.642
Connectors	All	7.500E-06	1.345E-03	1.53E-06(SV)^0.736
Flanges	All	3.100E-07	3.020E-03	4.53E-06(SV)^0.706
Open-ended lines	All	2.000E-06	1.495E-03	1.90E-06(SV)^0.724

APPENDIX D

BACT Guidelines

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 7.2.2*

Last Update: 7/22/2020

Petroleum Refining - Valves & Connectors

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 100 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4455		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a State Implementation Plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source**

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 7.2.3*

Last Update: 7/22/2020

Petroleum Refining - Pump and Compressor Seals

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 500 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4455		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a State Implementation Plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source**

APPENDIX E

BACT Analysis

Top Down BACT Analysis – Valves and Connectors

VOC emissions may occur from liquids and gases at valves and connectors from the refinery processes when piped to various operations at the refinery.

Step 1 - Identify All Possible Control Technologies

BACT Guideline 7.2.2 lists the controls that are considered potentially applicable to petroleum refining -valves and connectors. The VOC control measures are summarized below.

Achieved in Practice:

Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 100 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4455.

Step 2 - Eliminate Technologically Infeasible Options

All of the above identified control options are technologically feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 100 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4455.

Step 4 - Cost Effectiveness Analysis

The applicant is proposing the most effective control technology – Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 100 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4455. Therefore, a cost effectiveness analysis is not required.

Step 5 - Select BACT

Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 100 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4455.

Top Down BACT Analysis – Pumps and Compressor Seals

VOC emissions may occur from liquids and gases at pumps and compressor seals from the refinery processes when piped to various operations at the refinery.

Step 1 - Identify All Possible Control Technologies

BACT Guideline 7.2.3 lists the controls that are considered potentially applicable to petroleum refining -valves and connectors. The VOC control measures are summarized below.

Achieved in Practice:

Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 500 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4455

Step 2 - Eliminate Technologically Infeasible Options

All of the above identified control options are technologically feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 500 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule.

Step 4 - Cost Effectiveness Analysis

The applicant is proposing the most effective control technology – Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 500 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4455. Therefore, a cost effectiveness analysis is not required.

Step 5 - Select BACT

Leak defined as a dripping rate of more than three (3) drops per minute of liquid containing VOC or as a reading of methane, in excess of 500 ppmv above background when measured per EPA Method 21, for all components, and an Inspection and Maintenance Program pursuant to District Rule 4455.

APPENDIX F

Health Risk Assessment

San Joaquin Valley Air Pollution Control District

Risk Management Review

To: Dan Klevann – Permit Services
From: Yu Vu – Technical Services
Date: April 29, 2026
Facility Name: KERN ENERGY
Location: PANAMA LN & WEEDPATCH HWY, BAKERSFIELD
Application #(s): S-37-178-0
Project #: S-1251187

1. Summary

1.1 Risk Management Review (RMR)

Units	Prioritization Score	Acute Hazard Index	Chronic Hazard Index	Maximum Individual Cancer Risk	T-BACT Required	Special Permit Requirements
178	0.003	2.86E-03	7.95E-05	7.97E-09	No	No
Project Totals	0.003	2.86E-03	7.95E-05	7.97E-09		
Facility Totals	>1	9.60E-01	9.45E-02	1.82E-05		

1.2 Proposed Permit Requirements

To ensure that human health risks will not exceed District allowable levels; the following shall be included as requirements for:

Unit # 178-0

1. No special requirements.

2. Project Description

Technical Services received a request to perform a Risk Management Review (RMR) for the following:

- Unit -178-0: HYDROGEN RECOVERY UNIT

Although an ambient air quality analysis (AAQA) was also requested, the only emissions associated with the project are VOC emissions. There are currently no ambient air quality standards for VOCs, therefore, an AAQA was not performed.

3. RMR Report

3.1 Analysis

The District performed an analysis pursuant to the District's Risk Management Policy for Permitting New and Modified Sources (APR 1905, May 28, 2015) to determine the possible cancer and non-cancer health impact to the nearest resident or worksite. This policy requires that

an assessment be performed on a unit by unit basis, project basis, and on a facility-wide basis. If a preliminary prioritization analysis demonstrates that:

- A unit's prioritization score is less than the District's significance threshold and;
- The project's prioritization score is less than the District's significance threshold and;
- The facility's total prioritization score is less than the District's significance threshold

Then, generally no further analysis is required.

The District's significant prioritization score threshold is defined as being equal to or greater than 1.0. If a preliminary analysis demonstrates that either the units', the project's or the facility's total prioritization score is greater than the District threshold, a screening or a refined assessment is required.

If a refined assessment is greater than one in a million but less than 20 in a million for carcinogenic impacts (cancer risk) and less than 1.0 for the acute and chronic hazard indices (non-carcinogenic) on a unit by unit basis, project basis and on a facility-wide basis the proposed application is considered less than significant. For units that exceed a cancer risk of one in a million, Toxic Best Available Control Technology (TBACT) must be implemented.

Air toxics emissions for this project were calculated using the following methods:

- Per the project engineer, VOC emissions from this source can be attributed to two products; Marathon Petroleum Toluene and Chevron Philips Methylcyclohexane. Upon inspection of the safety data sheets for the two products, it was determined that only the Marathon Petroleum Toluene contained hazardous air pollutants (HAPs). The Marathon Petroleum Toluene contained Toluene (CAS# 108883, up to 100% by weight) and Benzene (CAS# 71432, up to 0.25% by weight). As a conservative assumption the worst-case weight percentages of each pollutant were applied to the total VOC emissions and then summed in order to determine the total HAP emissions.

These emissions were input into the San Joaquin Valley APCD's Hazard Assessment and Reporting Program (SHARP). In accordance with the District's Risk Management Policy, risks from the proposed unit's toxic emissions were prioritized using the procedure in the 2016 CAPCOA Facility Prioritization Guidelines. The prioritization score for this proposed facility was greater than 1.0 (see RMR Summary Table). Therefore, a refined health risk assessment was required.

The AERMOD model was used, with the parameters outlined below and meteorological data for 2008-2011 from Arvin (rural dispersion coefficient selected) to determine the dispersion factors (i.e., the predicted concentration or X divided by the normalized source strength or Q) for a receptor grid. These dispersion factors were input into the SHARP Program, which then used the Air Dispersion Modeling and Risk Tool (ADMRT) of the Hot Spots Analysis and Reporting Program Version 2 (HARP 2) to calculate the chronic and acute hazard indices and the carcinogenic risk for the project.

The following parameters were used for the review:

Source Process Rates					
Unit ID	Process ID	Process Material	Process Units	Hourly Process Rate	Annual Process Rate
178	1	VOC Emissions	lbs	0.05	483

Area Source Parameters					
Unit ID	Unit Description	Release Height (m)	X-Length (m)	Y -Length (m)	Area (m ²)
178	Hydrogen Recovery Unit	1.22	32.30	107.57	3474.51

4. Conclusion

4.1 RMR

The cumulative acute and chronic indices for this facility, including this project, are below 1.0; and the cumulative cancer risk for this facility, including this project, is less than 20 in a million. In addition, the cancer risk for each unit in this project is less than 1.0 in a million. **In accordance with the District's Risk Management Policy, the project is approved without Toxic Best Available Control Technology (T-BACT).**

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

5. Attachments

- A. Modeling request from the project engineer
- B. Additional information from the applicant/project engineer
- C. Prioritization score w/ toxic emissions summary
- D. Facility Summary

APPENDIX G

SSPE1 Calculations (SSPE1)

Permit #			Mod	NOx	SOx	PM10	CO	VOC
S	37	1	18	37844	17556	14716	116684	7573
S	37	2	10	0	0	0	0	13656
S	37	3	11	6990	4194	1771	8622	34067
S	37	4	20	15768	9461	3995	19447	40005
S	37	5	4	0	0	0	0	0
S	37	6	20	9000	257	684	27000	495
S	37	7	8	0	0	0	0	4025
S	37	8	38	0	0	0	0	4358
S	37	9	13	0	0	0	0	0
S	37	12	4	0	0	0	0	0
S	37	13	4	0	0	0	0	0
S	37	14	4	0	0	0	0	0
S	37	15	5	0	0	0	0	0
S	37	16	7	0	0	0	0	110
S	37	18	4	0	0	0	0	0
S	37	19	4	0	0	0	0	0
S	37	20	5	0	0	0	0	0
S	37	21	12	0	0	0	0	21170
S	37	22	12	0	0	0	0	21170
S	37	23	9	0	0	0	0	1205
S	37	24	6	0	0	0	0	297
S	37	25	5	0	0	0	0	0
S	37	26	5	0	0	0	0	0
S	37	27	5	0	0	0	0	275
S	37	28	6	0	0	0	0	37
S	37	31	8	0	0	0	0	339
S	37	34	7	0	0	0	0	371
S	37	38	13	1537	910	687	15899	2473
S	37	42	5	0	0	0	0	840
S	37	43	5	0	0	0	0	1752
S	37	44	6	0	0	0	0	137
S	37	46	7	0	0	0	0	11505
S	37	48	5	0	0	0	0	986
S	37	49	5	0	0	0	0	1022
S	37	50	6	0	0	0	0	219
S	37	51	6	0	0	0	0	1570
S	37	52	7	0	0	0	0	1095
S	37	53	6	0	0	0	0	694
S	37	56	5	0	0	0	0	365
S	37	57	8	0	0	0	0	1935
S	37	58	4	0	0	0	0	5519
S	37	59	6	0	0	0	0	329
S	37	61	8	0	0	0	0	475
S	37	65	6	0	0	0	0	183
S	37	66	6	0	0	0	0	197
S	37	67	5	0	0	0	0	2117
S	37	71	7	0	0	0	0	219
S	37	77	21	9490	5330	2410	11680	19489
S	37	78	5	0	0	0	0	0

S	37	79	5	0	0	0	0	183
S	37	80	4	208	0	8	77	6
S	37	81	4	496	0	20	184	15
S	37	82	5	99	0	1	162	1
S	37	83	5	247	0	2	405	3
S	37	90	6	0	0	0	0	1679
S	37	91	7	0	0	0	0	475
S	37	93	5	0	0	0	0	0
S	37	94	8	0	0	0	0	1273
S	37	95	9	0	0	0	0	475
S	37	96	8	0	0	0	0	475
S	37	97	6	0	0	0	0	1460
S	37	102	7	0	0	0	0	1643
S	37	107	5	0	0	0	0	0
S	37	108	4	0	0	0	0	1427
S	37	109	4	0	0	0	0	0
S	37	111	9	0	0	0	0	412
S	37	114	8	6826	2115	5120	10017	1929
S	37	116	7	4447	2063	618	21843	346
S	37	118	6	6332	3509	1578	23045	12160
S	37	119	8	13575	6994	3749	54694	400
S	37	120	4	0	0	0	0	938
S	37	121	5	0	0	0	0	913
S	37	122	8	4464	12718	300	4290	1069
S	37	123	4	1366	32	50	215	41
S	37	125	4	0	0	0	0	127
S	37	126	4	0	0	0	0	4552
S	37	127	5	0	0	0	0	551
S	37	130	6	0	0	0	0	2257
S	37	131	4	0	0	0	0	417
S	37	138	4	0	0	0	0	730
S	37	139	4	0	0	0	0	0
S	37	140	4	0	0	0	0	0
S	37	141	4	0	0	0	0	402
S	37	142	4	0	0	0	0	0
S	37	143	4	0	0	0	0	0
S	37	147	2	0	0	0	0	1115
S	37	148	2	0	0	0	0	5538
S	37	149	3	0	0	0	0	9473
S	37	150	2	0	0	0	0	241
S	37	153	1	0	0	0	0	1037
S	37	154	1	0	0	0	0	1037
S	37	155	1	0	0	0	0	1323
S	37	157	1	278	43	297	1891	232
S	37	158	1	1449	688	1835	4466	1304
S	37	159	1	365	56	359	2478	305
S	37	160	1	365	56	359	2478	305
S	37	161	1	365	56	359	2478	305
S	37	163	1	365	56	359	2478	305
S	37	164	1	365	56	359	2478	305
S	37	165	1	365	56	359	2478	305

S	37	166	0	0	0	0	0	2104
S	37	167	0	0	0	0	0	100
S	37	169	0	0	0	0	0	3431
S	37	171	0	0	0	0	0	198
S	37	172	0	0	0	0	0	258
S	37	173	0	0	0	0	0	157
S	37	174	1	0	0		0	256
S	37	175	0	0	0	0	0	438
S	37	176	0	0	0	0	0	109
SSPE1				122,606	66,206	39,995	335,489	268,814

APPENDIX H

SSPE2 Calculations (SSPE2)

Permit #			Mod	NOx	SOx	PM10	CO	VOC
S	37	1	18	37844	17556	14716	116684	7573
S	37	2	10	0	0	0	0	13656
S	37	3	11	6990	4194	1771	8622	34067
S	37	4	20	15768	9461	3995	19447	40005
S	37	5	4	0	0	0	0	0
S	37	6	20	9000	257	684	27000	495
S	37	7	8	0	0	0	0	4025
S	37	8	38	0	0	0	0	4358
S	37	9	13	0	0	0	0	0
S	37	12	4	0	0	0	0	0
S	37	13	4	0	0	0	0	0
S	37	14	4	0	0	0	0	0
S	37	15	5	0	0	0	0	0
S	37	16	7	0	0	0	0	110
S	37	18	4	0	0	0	0	0
S	37	19	4	0	0	0	0	0
S	37	20	5	0	0	0	0	0
S	37	21	12	0	0	0	0	21170
S	37	22	12	0	0	0	0	21170
S	37	23	9	0	0	0	0	1205
S	37	24	6	0	0	0	0	297
S	37	25	5	0	0	0	0	0
S	37	26	5	0	0	0	0	0
S	37	27	5	0	0	0	0	275
S	37	28	6	0	0	0	0	37
S	37	31	8	0	0	0	0	339
S	37	34	7	0	0	0	0	371
S	37	38	13	1537	910	687	15899	2473
S	37	42	5	0	0	0	0	840
S	37	43	5	0	0	0	0	1752
S	37	44	6	0	0	0	0	137
S	37	46	7	0	0	0	0	11505
S	37	48	5	0	0	0	0	986
S	37	49	5	0	0	0	0	1022
S	37	50	6	0	0	0	0	219
S	37	51	6	0	0	0	0	1570
S	37	52	7	0	0	0	0	1095
S	37	53	6	0	0	0	0	694
S	37	56	5	0	0	0	0	365
S	37	57	8	0	0	0	0	1935
S	37	58	4	0	0	0	0	5519
S	37	59	6	0	0	0	0	329
S	37	61	8	0	0	0	0	475
S	37	65	6	0	0	0	0	183
S	37	66	6	0	0	0	0	197
S	37	67	5	0	0	0	0	2117
S	37	71	7	0	0	0	0	219
S	37	77	21	9490	5330	2410	11680	19489
S	37	78	5	0	0	0	0	0
S	37	79	5	0	0	0	0	183

S	37	80	4	208	0	8	77	6
S	37	81	4	496	0	20	184	15
S	37	82	5	99	0	1	162	1
S	37	83	5	247	0	2	405	3
S	37	90	6	0	0	0	0	1679
S	37	91	7	0	0	0	0	475
S	37	93	5	0	0	0	0	0
S	37	94	8	0	0	0	0	1273
S	37	95	9	0	0	0	0	475
S	37	96	8	0	0	0	0	475
S	37	97	6	0	0	0	0	1460
S	37	102	7	0	0	0	0	1643
S	37	107	5	0	0	0	0	0
S	37	108	4	0	0	0	0	1427
S	37	109	4	0	0	0	0	0
S	37	111	9	0	0	0	0	412
S	37	114	8	6826	2115	5120	10017	1929
S	37	116	7	4447	2063	618	21843	346
S	37	118	6	6332	3509	1578	23045	12160
S	37	119	8	13575	6994	3749	54694	400
S	37	120	4	0	0	0	0	938
S	37	121	5	0	0	0	0	913
S	37	122	8	4464	12718	300	4290	1069
S	37	123	4	1366	32	50	215	41
S	37	125	4	0	0	0	0	127
S	37	126	4	0	0	0	0	4552
S	37	127	5	0	0	0	0	551
S	37	130	6	0	0	0	0	2257
S	37	131	4	0	0	0	0	417
S	37	138	4	0	0	0	0	730
S	37	139	4	0	0	0	0	0
S	37	140	4	0	0	0	0	0
S	37	141	4	0	0	0	0	402
S	37	142	4	0	0	0	0	0
S	37	143	4	0	0	0	0	0
S	37	147	2	0	0	0	0	1115
S	37	148	2	0	0	0	0	5538
S	37	149	3	0	0	0	0	9473
S	37	150	2	0	0	0	0	241
S	37	153	1	0	0	0	0	1037
S	37	154	1	0	0	0	0	1037
S	37	155	1	0	0	0	0	1323
S	37	157	1	278	43	297	1891	232
S	37	158	1	1449	688	1835	4466	1304
S	37	159	1	365	56	359	2478	305
S	37	160	1	365	56	359	2478	305
S	37	161	1	365	56	359	2478	305
S	37	163	1	365	56	359	2478	305
S	37	164	1	365	56	359	2478	305
S	37	165	1	365	56	359	2478	305
S	37	166	0	0	0	0	0	2104

S	37	167	0	0	0	0	0	100
S	37	169	0	0	0	0	0	3431
S	37	171	0	0	0	0	0	198
S	37	172	0	0	0	0	0	258
S	37	173	0	0	0	0	0	157
S	37	174	1	0	0		0	256
S	37	175	0	0	0	0	0	438
S	37	176	0	0	0	0	0	109
S	37	178	0	0	0	0	0	483
SSPE2				122,606	66,206	39,995	335,489	269,297

APPENDIX I

Quarterly Net Emissions Change (QNEC)

Quarterly Net Emissions Change (QNEC)

The Quarterly Net Emissions Change is used to complete the emission profile screen for the District's PAS database. The QNEC shall be calculated as follows:

$QNEC = PE2 - PE1$, where:

QNEC = Quarterly Net Emissions Change for each emissions unit, lb/qtr.

PE2 = Post-Project Potential to Emit for each emissions unit, lb/qtr.

PE1 = Pre-Project Potential to Emit for each emissions unit, lb/qtr.

Using the values in Sections VII.C.2 and VII.C.1 in the evaluation above, quarterly PE2 and quarterly PE1 can be calculated as follows:

$$\begin{aligned} PE2_{\text{quarterly}} &= PE2_{\text{annual}} \div 4 \text{ quarters/year} \\ &= 483 \text{ lb/year} \div 4 \text{ qtr/year} \\ &= 120.75 \text{ lb VOC/qtr} \end{aligned}$$

$$\begin{aligned} PE1_{\text{quarterly}} &= PE1_{\text{annual}} \div 4 \text{ quarters/year} \\ &= 0 \text{ lb/year} \div 4 \text{ qtr/year} \\ &= 0 \text{ lb VOC/qtr} \end{aligned}$$

Quarterly NEC [QNEC]			
Pollutant	PE2 (lb/qtr)	PE1 (lb/qtr)	QNEC (lb/qtr)
NOx	0	0	0
SOx	0	0	0
PM10	0	0	0
CO	0	0	0
VOC	483	0	121

APPENDIX J

Compliance Certification



San Joaquin Valley Air Pollution Control District



TITLE V MODIFICATION - COMPLIANCE CERTIFICATION FORM

I. TYPE OF PERMIT ACTION (Check appropriate box)

☒ ADMINISTRATIVE AMENDMENT ☐ MINOR MODIFICATION ☒ SIGNIFICANT MODIFICATION

COMPANY NAME: Kern Energy		FACILITY ID: S-37
1. Type of Organization: ☒ Corporation ☐ Sole Ownership ☐ Government ☐ Partnership ☐ Utility		
2. Owner's Name: Kern Energy		
3. Agent to the Owner:		

II. COMPLIANCE CERTIFICATION (Read each statement carefully and initial applicable circles for confirmation):

- ☒ Based on information and belief formed after reasonable inquiry, the equipment identified in this application will continue to comply with the applicable federal requirement(s).
- ☒ Based on information and belief formed after reasonable inquiry, the equipment identified in this application will comply with applicable federal requirement(s) that will become effective during the permit term, on a timely basis.
- ☒ Corrected information will be provided to the District when I become aware that incorrect or incomplete information has been submitted.
- ☒ Based on information and belief formed after reasonable inquiry, information and statements in the submitted application package, including all accompanying reports, and required certifications are true, accurate, and complete.
- ☒ For minor modifications, this application meets the criteria for use of minor permit modification procedures pursuant to District Rule 2520.

I declare, under penalty of perjury under the laws of the state of California, that the forgoing is correct and true:

Signature of Responsible Official

3/13/2025

Date

Melinda Palmer

Name of Responsible Official (please print)

VP-Regulatory & Public Affairs

Title of Responsible Official (please print)

APPENDIX K

ERC Surplus Determination

San Joaquin Valley Air Pollution Control District

Surplus ERC Analysis

Facility Name: Kern Energy
Mailing Address: 7724 East Panama Lane
Bakersfield, CA 93307
Contact Person: Gabe Castro
Telephone: (661) 845-0761
ERC Certificate #: C-1579-1
Project #: C-1251187

Date: September 15, 2025
Engineer: Dan Klevann
Lead Engineer: Erin Scott

I. Proposal

Kern Energy has requested the District to perform an analysis of the current surplus value of the following Emission Reduction Credit (ERC) certificate:

Proposed ERC Certificate	
Certificate #	Criteria Pollutant
C-1579-1	VOC

The purpose of this analysis is to ensure that the emission reductions on this ERC certificate are surplus of all applicable Federal requirements; therefore, this analysis establishes the surplus value of the ERC certificate as of the date of this analysis. The current face value and surplus value of the ERC certificate evaluated in this analysis are summarized in the following table:

Criteria Pollutant Summary: VOC

ERC Certificate C-1579-1				
Pollutant	1 st Qtr. (lb/qtr)	2 nd Qtr. (lb/qtr)	3 rd Qtr. (lb/qtr)	4 th Qtr. (lb/qtr)
Current Value	2,000	2,000	2,000	2,000
Surplus Value	2,000	2,000	2,000	2,000

II. Individual ERC Certificate Analysis

ERC Certificate C-1579-1

A. ERC Background

Criteria Pollutant: VOC

ERC Certificate C-1579-1 is a certificate that was split out from parent ERC Certificate C-3-1. Original ERC Certificate C-3-1 was issued to Fruehauf Trailer Corporation (subsequently Fruehauf Trailer Services Inc., Facility C-2268; now defunct) on November 5, 1992 under Project C-92003. The ERCs were generated from the shutdown of a truck trailer coating operation. The following table summarizes the values of the original parent certificate and the current value of the subject certificate proposed to be utilized as a part of the current District analysis:

ERC Certificates C-3-1 and C-1579-1				
Pollutant	1 st Qtr. (lb/qtr)	2 nd Qtr. (lb/qtr)	3 rd Qtr. (lb/qtr)	4 th Qtr. (lb/qtr)
Original Value of Parent Certificate C-3-1	5,547	6,575	4,753	6,696
Current Value of ERC Certificate C-1579-1	2,000	2,000	2,000	2,000

B. Applicable Rules and Regulations at Time of Original Banking Project

Based on the application review for the original ERC banking project, the following rules and regulations were evaluated to determine the surplus value of actual VOC emission reductions generated by the reduction project.

1. District Rules

Rule 220.1 – New and Modified Stationary Source Review

Rule 230.1 – Emission Reduction Credit Banking

Rule 230.2 – Community Bank

Rule 460.3 – Surface Coating of Metal Parts and Products

The application review for the original ERC banking project demonstrated that the ERC credit complied with the requirements of these rules at the time it was issued.

2. Federal Rules and Regulations

There were no applicable federal rules or regulations identified that applied at the time of this original ERC banking action; therefore, no further discussion is required.

C. New or Modified Rule and Regulations Applicable to the Original Banking Project

All District and federal rules and regulations that have been adopted or amended since the date the original banking project was finalized will be evaluated below:

1. District Rules:

Rule 2201 – New and Modified Stationary Source Review (4/20/2023)

Rule 2301 – Emission Reduction Credit Banking (4/20/2023)

Rule 2302 – Community Bank (12/17/1992)

District Rules 220.1, 230.1, and 230.2 have been renamed 2201, 2301, and 2302, respectively, since the original ERC certificate was issued. Rules 2201 and 2301 have also been amended. However, the requirements of these rules only applied at the time of the original banking action. Thus, no further evaluation of these rules will be conducted in this analysis.

Rule 4603 – Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Crafts (9/17/2009)

District Rule 460.3 has been renamed 4603, and amended, since the original ERC certificate was issued. However, the applicable requirements in the amended rule (i.e. VOC content limit of 2.8 lb/gal and application method transfer efficiency of 65%) have not changed. The original ERC therefore remains surplus of the requirements of this rule.

Rule 4612 – Motor Vehicle and Mobile Equipment Coating Operations (10/21/2010)

The requirements of this rule would have been applicable to the operation that was shut down since truck trailers are mobile equipment. However, the applicable requirements in this rule (i.e. VOC content limit of 2.8 lb/gal for single-stage coatings and application method transfer efficiency of 65%) are equivalent to the corresponding requirements in Rule 4603, which were evaluated during the original banking action. The original ERC therefore remains surplus of the requirements of this rule.

2. Federal Rules and Regulations:

40 CFR Part 63 Subpart MMMM – National Emission Standards for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products

Pursuant to §63.3881(c)(16), this subpart does not apply to surface coating of assembled on-road vehicles that meet the applicability criteria for the assembled on-road vehicle subcategory in plastic parts and products surface coating (40 CFR part 63, subpart PPPP).

Pursuant §63.3981, assembled on-road vehicle coating means any coating operation in which coating is applied to the surface of some component or surface of a fully assembled motor vehicle or trailer intended for on-road use including, but not limited to, components or surfaces on automobiles and light-duty trucks that have been repaired after a collision or otherwise repainted, fleet delivery trucks, and motor homes and other recreational vehicles (including camping trailers and fifth wheels). Assembled on-road vehicle coating includes the concurrent coating of parts of the assembled on-road vehicle that are painted off-vehicle to protect systems, equipment, or to allow full coverage. Assembled on-road vehicle coating does not include surface coating operations that meet the applicability criteria of the automobiles and light-duty trucks NESHAP. Assembled on-road vehicle coating also does not include the use of adhesives, sealants, and caulks used in assembling on-road vehicles.

The original ERC therefore remains surplus of the requirements of this subpart.

40 CFR Part 63 Subpart PPPP – National Emission Standards for Hazardous Air Pollutants for Surface Coating of Plastic Parts and Products

Pursuant §63.4481(a)(5), the assembled on-road vehicle coating subcategory includes surface coating of fully assembled motor vehicles and trailers intended for on-road use, including, but not limited to: automobiles, light-duty trucks, heavy duty trucks, and busses that have been repaired after a collision or otherwise repainted; fleet delivery trucks; and motor homes and other recreational vehicles (including camping trailers and fifth wheels). This subcategory also includes the incidental coating of parts, such as radiator grilles, that are removed from the fully assembled on-road vehicle to facilitate concurrent coating of all parts associated with the vehicle. The assembled on-road vehicle coating subcategory does not include the surface coating of plastic parts prior to their attachment to an on-road vehicle on an original equipment manufacturer's (OEM) assembly line. The assembled on-road vehicle coating subcategory also does not include the use of adhesives, sealants, and caulks used in assembling on-road vehicles. Body fillers used to correct small surface defects and rubbing compounds used to remove surface scratches are not considered coatings subject to this subpart.

Pursuant to §63.4481, this subpart is applicable to new, reconstructed, or existing operations that use 100 gallons per year, or more, of coatings that contain hazardous air pollutants (HAP) in the surface coating of plastic parts and products and that are major sources of HAP emissions. A major source of HAP emissions is any stationary

source with the potential to emit any single HAP at a rate of 10 tons or more per year or any combination of HAP at a rate of 25 tons or more per year. Although HAP potential to emit for the subject stationary source has not been determined, compliance with the requirements of this subpart will be evaluated for expediency.

Pursuant §63.4482(c), new sources are those that commenced construction after December 4, 2002 by installing new coating equipment. Since subject operation was shut down in 1992, it would have been classified as an existing source.

Pursuant to §63.4490(a)(4), existing assembled on-road vehicle coating affected sources are required to limit organic HAP emissions to no more than 1.34 lb of organic HAP emitted per lb of coating solids used during each 12-month compliance period.

The original ERC was based on a VOC content of 2.8 lb/gal for all coatings used. The worst-case possible organic HAP content is therefore 2.8 lb/gal. Thus, the minimum solids content required for compliance is 2.09 lb/gal (i.e. $[2.8 \text{ lb-HAP/gal}] / [1.34 \text{ lb-HAP/lb-Solids}]$). According to the information provided in the original ERC banking evaluation, the coatings used were generally high solids coatings. Currently available information indicates that the lowest solids contents for such coatings range from 2.8 lb/gal to 6.1 lb/gal. Thus, based on the worst-case assumptions, any potential HAP emission rate from the subject operation would have been clearly below the limit required by this subpart. The original ERC therefore remains surplus of the requirements of this subpart.

40 CFR Part 63 Subpart HHHHHH – National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources

This subpart specifies work practice standards to limit methylene chloride emissions from paint stripping solvents. The subpart also requires the use of enclosed paint booths with filters and HVLP spray technology for the control of particulate matter emissions. The subpart does not contain any VOC content limits or other specific standards or requirements that could be applicable to VOC emissions from coatings. The original ERC therefore remains surplus of the requirements of this subpart.

D. Surplus at Time of Use Adjustments to ERC Quantities

As demonstrated in the section above, the emissions reductions from permit units in the original banking project continue to be surplus of all applicable District and Federal Rules and Regulations. Therefore, no discounting to the ERC values are necessary for surplus at time of use considerations.

E. Surplus Value of ERC Certificate

The emissions continue to be Surplus of all District and Federal Rules and Regulations; therefore, no adjustments to the ERC values are necessary.

ERC Certificate C-4160-1 – Criteria Pollutant VOC					
		1 st Qtr. (lb/qtr)	2 nd Qtr. (lb/qtr)	3 rd Qtr. (lb/qtr)	4 th Qtr. (lb/qtr)
(A)	Current ERC Quantity	2,000	2,000	2,000	2,000
(B)	Percent Discount	0%	0%	0%	0%
(C) = (A) x [1 – (B)]	Surplus Value	2,000	2,000	2,000	2,000

RULE 460.3 SURFACE COATING OF METAL PARTS AND PRODUCTS
(Adopted April 11, 1991; Amended September 19, 1991)

I. Applicability

The provisions of this rule shall apply to the surface coating of metal parts or products.

II. Definitions

- A. Aerospace Vehicles: the completed unit of any aircraft, helicopter, missile or space vehicle.
- B. Air Dried: a process whereby the coated object is cured or dried at ambient temperature or at a temperature up to a maximum of 90°C (194°F).
- C. Baked: a process whereby the coated object is heated above ambient temperature to a temperature above 90°C (194°F) for the purpose of curing or drying.
- D. Brush Coating: the manual application of coatings using brushes or rollers.
- E. Camouflage Coating: a coating applied on military equipment to conceal such equipment from detection.
- F. Coils: metal sheets or strips which are rolled into coils for further industrial or commercial use.
- G. Continuous Coating: a enclosed coating system where spray nozzles coat metal parts and products as they are conveyed through the enclosure. Water wash zones control the inlet and outlet of the enclosure. Excess coating drains into a recirculation system.
- H. Dip Coating: the process in which a substrate is immersed in a solution (or dispersion) containing the coating material, and then withdrawn.
- I. Electrodeposition: a dip coating application method where the paint solids are given an electrical charge which is then attracted to a substrate.
- J. Electrostatic Application: a method of spray application of coatings where an electrostatic potential is created between the parts to be coated and the paint particles.

K. Extreme Performance Coating: a coating used on a metal surface where the coated surface is, in its intended use, exposed to any of the following:

1. Industrial grade detergents, cleaners, or abrasive scouring agents.
2. Unprotected shipboard conditions.
3. Temperatures consistently in excess of 95°C (203°F) or continuous exposure to corrosive environmental conditions.

L. Flow Coating: a coating application system where paint flows over the part and the excess coating drains back into the collection system.

M. Grams of VOC per Liter of Coating Applied, Excluding Water and Exempt Compounds: the weight of VOC per combined volume of VOC and coating solids and can be calculated by the following equation:

$$\begin{array}{l} \text{Grams of VOC per Liter of} \\ \text{Coating Applied Excluding} \\ \text{Water and Exempt Compounds} = \frac{Ws - Ww - Wec}{Vm - Vw - Vec} \end{array}$$

Where: Ws = weight of volatile compounds in grams
 Ww = weight of water in grams
 Wec = weight of exempt compounds in grams
 Vm = volume of material in liters
 Vw = volume of water in liters
 Vec = volume of exempt compounds in liters

N. Grams of VOC per liter of Material: the weight of VOC per volume of material and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Material} = \frac{Ws - Ww - Wec}{Vm}$$

Where: Ws = weight of volatile compounds in grams
 Ww = weight of water in grams
 Wec = weight of exempt compounds in grams
 Vm = volume of material in liters

O. High Performance Architectural Coating: a coating used to protect architectural subsections and which meets the requirements of the Architectural Aluminum Manufacturers Association publication number AAMA 605.2-1980.

- P. Heat Resistant Coating: any coating which during normal use must withstand temperatures of at least 204°C (400°F).
- Q. High Gloss Coating: any coating which achieves at least 85% reflectance on a 60° meter when tested by ASTM Method D-523.
- R. High Temperature: any coating applied to a substrate which during normal use must withstand temperatures of at least 560°C (1000°F).
- S. High Volume, Low Pressure Spray: spray equipment used to apply a coating by means of a gun which operates between 0.1 and 10.0 psig air pressure.
- T. Light-Duty Truck: any truck having a manufacturer's maximum gross vehicle weight rating of under 6,001 pounds.
- U. Magnet Wire: wire used in electromagnetic field application in electrical machinery and equipment such as transformers, motors, generators, and magnetic tape recorders.
- V. Marine Vessel: any tugboat, tanker, freighter, passenger ship, barge, or other boat, ship, or watercraft. This includes both salt water and fresh water vessels.
- W. Metal Containers or Closures: the interior or the exterior of formed metal cans, drums, pails, or crowns; or flat metal sheets which are intended to be formed into cans, drums, pails, lids, or crowns.
- X. Metallic/iridescent Topcoat: any coating which contains more than 5 g/l (0.042 lb/gal) of metal or iridescent particles, as applied, where such particles are visible in the dried film.
- Y. Metal Parts and Products: any component or complete unit fabricated from metal, except those subject to the coating provisions of other source specific rules.
- Z. Motor Vehicle: a vehicle which is self-propelled and is a device by which any person or property may be propelled, moved or drawn upon a highway, excepting a device moved by human power or used exclusively upon stationary rails or tracks.

- AA. Pretreatment Wash Primer: any coating which contains no more than 12% solids by weight, and a minimum of 0.5% acid by weight, is necessary to provide surface etching, and is applied directly to bare metal surfaces to provide corrosion resistance and adhesion.
- BB. Repair: recoating portions of previously coated product to cover mechanical damage to the coating following normal painting operations.
- CC. Roll Coating: the application of coatings from a paint trough to a flat surface by a mechanical series of rollers.
- DD. Silicone Release: a coating which contains silicone resin and has as its primary function the release of food products from metal surfaces such as baking pans.
- EE. Solar Absorbent Coating: a coating which has as its primary purpose the absorption of solar radiation.
- FF. Touch Up: that portion of the coating operation which is incidental to the main coating process but necessary to cover minor imperfections or to achieve coverage as required.
- GG. Volatile Organic Compound (VOC): any compound containing at least one atom of carbon except for the following exempt compounds:
- methane,
 - carbon monoxide,
 - carbon dioxide,
 - carbonic acid,
 - metallic carbides or carbonates,
 - ammonium carbonates,
 - methylene chloride,
 - methyl chloroform (1,1,1-trichloroethane),
 - CFC-113 (trichlorotrifluoroethane),
 - CFC-11 (trichlorofluoromethane),
 - CFC-12 (dichlorodifluoromethane),
 - CFC-22 (chlorodifluoromethane),
 - FC-23 (trifluoromethane),
 - CFC-114 (dichlorotetrafluoroethane),
 - CFC-115 (chloropentafluoroethane),
 - HCFC-123 (dichlorotrifluoroethane),
 - HFC-134a (tetrafluoroethane),
 - HCFC-141b (dichlorofluoroethane), and
 - HCFC-142b (chlorodifluoroethane).

III. Exemptions

- A. The requirements of this rule, except for Subsection VI.B, shall not apply to coatings which emit or may emit volatile organic compounds in excess of the specified limits provided that the total facility emissions from the use of such coatings do not exceed 15 pounds in any one day. Once a facility exceeds this exemption threshold it shall become subject to the requirements of this rule.
- B. The requirements of this Rule shall not apply to touch-up and repair.
- C. Any source which is in full compliance with the provisions of this Rule shall be exempt from otherwise applicable portions of the Organic Solvents Rule.
- D. The requirements of this Rule shall not apply to the application of coatings to automobiles, light-duty trucks, aircraft, aerospace vehicles, marine vessels, can, coils, and magnetic wire.
- E. The provisions of this Rule shall not apply to an operation subject to the requirements of Rule 460.2 - Motor Vehicle and Mobile Equipment Refinishing Operations.

IV. Requirements

- A. **General Limits:** Except as otherwise provided by this Rule, no person shall apply to any metal part or product any coating with a VOC content in excess of the following limits, expressed as grams of VOC per liter (or pounds per gallon) of coating applied, (less water and exempt compounds):

Baked Coating	275 g/l (2.3 lb/gal)
Air-Dried Coating	340 g/l (2.8 lb/gal)

- B. **Specialty Coating Limitations:** A person shall not apply to any metal part or product any specialty coating with a VOC content in excess of the limits, expressed as grams of VOC per liter (or pounds per gallon) of coating applied, (less water and exempt compounds):

Effective November 1, 1991

<u>Coating</u>	<u>Baked</u>	<u>Air-Dried</u>
Camouflage	360 g/l (3.0 lb/gal)	420 g/l (3.5 lb/gal)
Extreme Performance	420 (3.5)	420 (3.5)
Heat Resistant	360 (3.0)	420 (3.5)
High Gloss	360 (3.0)	420 (3.5)
High Performance Architectural	420 (3.5)	420 (3.5)
High Temperature	550 (4.6)	550 (4.6)
Metallic Topcoat	420 (3.5)	420 (3.5)
Pretreatment Wash Primer	780 (6.5)	780 (6.5)
Silicone Release	700 (5.8)	700 (5.8)
Solar Absorbent	360 (3.0)	420 (3.5)

- C. **Control Requirements:** The requirements of Subsections IV.A. and IV.B. shall not apply to any person who installs and operates air pollution control equipment with a minimum overall capture and control efficiency of 90 percent or more on a mass basis as determined in Subsection V.C. The control equipment shall be under District permit. The overall efficiency shall be equivalent or greater than those emission reduction levels achieved by any requirement specified in Subsections IV.A. or IV.B.

D. **Evaporative Loss Minimization:** Effective November 1, 1991, a person shall:

1. only use solvents with a VOC content of less than 200 grams VOC per liter of material (1.67 lbs/gal) for cleanup surface preparation, excluding cleaning of coating application equipment;
2. use closed containers for the storage or disposal of solvent-laden cloth or paper used for surface preparation and cleanup. Containers shall be nonabsorbent;
3. store fresh or spent solvent, coating, adhesive, catalyst, or thinner in closed containers; and
4. not use VOC-containing materials for spray equipment cleanup unless an enclosed system or equipment proven to be equally effective is used for cleaning. An enclosed system must totally enclose spray guns, cups, nozzles, bowls, and other parts during washing, rinsing and draining procedures.

E. **Application Equipment Requirements:** A person shall not use or operate any coating application equipment on any metal parts and products subject to the provisions of this rule unless one of the following methods is used:

1. Electrostatic Application;
2. Electrodeposition;
3. High Volume, Low Pressure Spray;
4. Flow Coating;
5. Roll Coating;
6. Dip Coating;
7. Brush Coating; or
8. Continuous Coating

F. **Prohibition of Specification:** No person shall solicit or require for use or specify the application of a coating subject to this Rule if such use or application results in a violation of any of the provisions of this Rule. The prohibition of this Subsection shall apply to all written or oral contracts under the terms of which any coating is to be applied to any metal part or product at any physical location within the District.

V. Administrative Requirements

A. Labeling Requirements:

1. **VOC Content:** Each container or accompanying data sheet of any coating subject to this Rule and manufactured after (one year from the date of adoption) shall display the maximum VOC content of the coating, as applied, and after any thinning as recommended by the manufacturer. VOC content shall be displayed as grams of VOC per liter of coating (less water and exempt compounds). VOC content displayed may be calculated using product formulation data, or may be determined using the test method in Subsection V.C.
2. **Thinning Recommendations:** Each container or accompanying data sheet of any coating subject to this rule and manufactured after (one year from date of adoption) shall display a statement of the manufacturer's recommendation regarding thinning of the coating. This requirement shall not apply to the thinning of coatings with water.

B. Record keeping:

Any person subject to Section IV. or exempt by Subsection III.A. shall comply with the following requirements:

1. Maintain a current list of coatings and solvents in use which contains all of the coating data necessary to evaluate compliance, including the following information, as applicable:
 - a. Mix ratio of components used.
 - b. VOC content and specific chemical constituents of coatings as applied.
 - c. VOC content and specific chemical constituents of solvents used for surface preparation and cleanup.
2. Maintain records which include the following information:
 - a. Volume coating/solvent mix ratio,
 - b. VOC content of coating (pounds/gallon),
 - c. Volume of each coating used (gallons), and

- d. Quantity of cleanup solvent used (gallons).

Consistent records may be kept in grams/liter and liters instead of pounds/gallon and gallons. Facilities subject to the requirements of Section IV. shall maintain such records on a daily basis.

Facilities which are exempt by Subsection III.A. may maintain such records on an extended basis provided the records substantiate emissions are less than 15 pounds per day for the entire extended period.

3. Such records shall be retained and made available for inspection by the Control Officer for the previous 24 month period.

C. Test Methods

1. Analysis of Samples: Samples of VOC as specified in this Rule shall be analyzed by EPA Method 24 and analysis of halogenated exempt compounds shall be analyzed by ARB Method 432.
2. Determination of Emissions: Emissions of VOC shall be measured by EPA Method 25, 25a, or 25b, as applicable, and analysis of halogenated exempt compounds shall be analyzed by ARB Method 422.
3. Capture efficiency shall be determined using methods in 55 Federal Register (FR) 26865 (June 29, 1990) as described under (a)(4)(iii) - Capture System Efficiency Test Protocols and Appendix B - Volatile Organic Material Measurement Techniques for Capture Efficiency. The procedure described under (a)(4)(iii)(2) of the above referenced FR shall be modified as follows: If a stationary source owner or operator uses a control device designed to collect and recover VOC (e.g., a carbon adsorber), an explicit measurement of capture efficiency is not necessary if the conditions described in 55 FR 26865 are met. The overall emission reduction efficiency shall be determined each day by directly comparing the input liquid VOC to the recovered liquid VOC. The procedure for use in this situation is specified in 40 CFR 60.433 with additional modifications described in 55 FR 26865.

4. The quantification of coating as a metallic/iridescent topcoat shall be determined by South Coast Air Quality Management District "Spectrographic Method for the Analysis of Carbon Dust and Carbon Laminates", December 1985.
5. Acid Content: Measurement of acid content of Pre-Treatment Wash Primers shall be conducted and reported in accordance with South Coast Air Quality Management District "Laboratory Methods of Analysis for Enforcement Samples, ASTM D1613-81 Standard Test Method for Acidity in Volatile Solvents and Chemical Intermediates used in Paint, Varnish, Lacquer, and Related Products", December, 1986.
6. Determination of emissions of VOC from spray gun cleaning systems shall be made using South Coast Air Quality Management District "General Method for Determining Solvent Losses from Spray Gun Cleaning Systems", dated 10/3/89.

VI. Compliance Schedule:

- A. Any person who becomes subject to the requirements of this Rule through loss of exemption shall comply with the following increments of progress:
 1. Within 6 months from date the exemption was lost, submit a complete application for an Authority to Construct, if necessary.
 2. Within 12 months from date the exemption was lost, be in full compliance with the requirements of this Rule.
- B. The owner or operator of any surface coating of metal parts and products operation which is subject to the requirements of this Rule and which is installed or constructed on or after April 11, 1991, shall be in full compliance with the requirements of this Rule at the time of initial operation.

APPENDIX L

ERC Withdrawal Calculations

VOC	1 st Quarter (lb)	2 nd Quarter (lb)	3 rd Quarter (lb)	4 th Quarter (lb)
ERC C-1579-1	2,000	2,000	2,000	2,000
Offsets Required (Includes distance offset ratio)	181	181	181	182
Amount Remaining	1,819	1,819	1,819	1,818
Credits reissued under ERC C-YYYY-1	1,819	1,819	1,819	1,818

APPENDIX M

Public Comments and District Response

Public Comment #1 (Leadership¹):

The VOC emission data listed in Appendices H and I is inconsistent with the rest of the evaluation.

District Response to Public Comment #1:

The commenter correctly identified inconsistencies in the VOC emissions data presented in Appendices H and I. The correct post-project Potential to Emit (PE2) for VOC emissions under Authority to Construct (ATC) S-37-178-0 is 483 lb/year and 1.3 lb/day, as shown in the project evaluation and Appendix C. The inconsistent values appearing in Appendices H and I were clerical errors and have been corrected. These corrections do not change the District's substantive conclusions regarding the project.

Public Comment #2 (Leadership):

Emission calculations rely on outdated guidelines, *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities*, (Correlation Equation) published by CAPCOA and CARB in 1999. Suggestions to use *Emissions Estimation Protocol for Petroleum Refineries – Version 3.0* (Version 3), published by EPA in 2015, and 40 CFR Part 60, Subparts OOOOb and OOOOc (OOOOb/c) were received. Additionally, when using the Correlation Equation, site-specific screening values must be used.

District Response to Public Comment #2:

The District disagrees that the emissions analysis relied on an inappropriate methodology. The 1999 California Implementation Guidelines were developed specifically for petroleum facilities in California and remain a valid guidance document for estimating fugitive hydrocarbon emissions. Both the 1999 California Implementation Guidelines and EPA's 2015 Emissions Estimation Protocol for Petroleum Refineries rely on EPA's 1995 equipment-leak protocol as the underlying framework for estimating refinery equipment-leak emissions. Accordingly, the 2015 EPA document does not identify a separate refinery equipment-leak methodology that replaces that underlying framework.

The District also disagrees that 40 CFR Part 60, Subparts OOOOb and OOOOc provide the applicable emissions-calculation methodology for this project. Those subparts apply to the crude oil and natural gas source category, not to a petroleum refinery unit. Neither subpart provides the applicable fugitive VOC emissions-estimation methodology for this petroleum refinery project.

For this preconstruction analysis, the District used the CAPCOA-revised correlation equations and factors together with projected component counts to estimate fugitive VOC emissions from the new unit. Because the project involves a new emissions unit, actual component-specific screening data do not yet exist. The District therefore used assumed screening values for the preconstruction estimate, as reflected in Appendix C. Those assumed values correspond to the applicable leak thresholds used in the evaluation and thus represent the maximum screening values allowed before a component would be considered leaking under the applicable requirements. The new components will be monitored under the facility's fugitive monitoring program after installation. The District concludes that this was a reasonable method for preparing a preconstruction emissions estimate for the proposed unit and that the use of leak-threshold screening values for the estimate was conservative.

Public Comment #3 (Leadership and Angelica Lopez):

The Public Notice Package was not made available to the AB 617 Arvin/Lamont Community Steering Committee or made available in Spanish. Suggestion received to post notices on homes and businesses.

¹Comments received within letter jointly representing Leadership Counsel for Justice & Accountability, Center on Race, Poverty & the Environment, Central Valley Air Quality Coalition, Central California Environmental Justice Network, Comite Progreso de Lamont, and Committee for a Better Arvin (Leadership)

District Response to Public Comment #3:

The District provided public notice for this Authority to Construct application in accordance with the applicable state and federal air permitting public notice requirements contained in the District's federally approved permitting rules. In accordance with the District's standard public notice procedures, the notice was posted on the District's website and distributed to interested persons who had subscribed to receive public notices by email, text message, or standard mail.

Consistent with the District's standard practice, the public notice itself was provided in both English and Spanish. In addition, after a member of the community requested a public hearing, the District scheduled that hearing, notified the Arvin/Lamont Community Steering Committee of the hearing, provided simultaneous interpretation services and Spanish-language materials at the hearing, and extended the public comment period to allow for additional community engagement. The District recognizes the importance of language access and community participation for projects of interest to nearby residents.

Public Comment #4 (Leadership):

The technical details in the engineering evaluation of the existing storage tanks and the new fuel cells are incomplete. Additionally, if a piece of equipment, such as a fuel cell, is exempt from permitting but is part of a process, the permit exemption determination shall be included in the engineering evaluation. Without this information, proper CEQA review cannot be conducted.

District Response to Public Comment #4:

The District disagrees that the engineering evaluation omitted information necessary to evaluate the air permitting aspects of the project. With respect to the existing storage tanks, the engineering evaluation states that toluene and methyl cyclohexane (MCH) will be stored in existing organic liquid storage tanks and that the project does not change the operation of existing components associated with the refinery units supplying the hydrogen stream. The existing tanks are already permitted organic liquid storage tanks connected to the refinery's existing vapor recovery systems, and they will continue to be used to store organic liquids. Because the tanks will continue to perform the same storage function and no change to their permitted operation was proposed as part of this project, the District did not treat the tanks as modified emissions units under this permitting action.

With respect to the fuel cells, the engineering evaluation identifies the fuel cells as PureCell Model 400 units and states that, based on manufacturer information included in Appendix B, emissions from the fuel cells are zero for NO_x, SO_x, CO, and VOC. The evaluation further states that, because emissions are less than 2.0 lb/day for each pollutant, the fuel cells are permit exempt, although they are listed on the new hydrogen recovery unit permit for clarification purposes.

The District therefore concludes that the engineering evaluation included sufficient information to address the air permitting issues presented by the existing tanks and the fuel cells for this project. See Response to Public Comment #5 regarding the commenters' CEQA-related arguments.

Public Comment #5 (Leadership):

Kern County did not prepare nor certify an environmental document under CEQA. Project may require a discretionary conditional use permit.

District Response to Public Comment #5:

According to CEQA Guidelines §21067, Kern County acted as the Lead Agency for CEQA, since they are the public agency with the principal responsibility for approving the project. The County determines whether the project may be constructed and operated at the proposed location and establishes the conditions necessary to authorize the project as a whole.

Under the County's Zoning Ordinance, building permits for improvements consistent with applicable zoning standards are issued ministerially. As a ministerial action, it follows a fixed permitting process without discretionary decision-making per Public Resources Code 21080(b)(1). Ministerial projects are exempt from CEQA per CEQA Guidelines §15268. Therefore, the County filed a Notice of Exemption from CEQA.

Additionally, the District has conducted its own Preliminary Review pursuant to CEQA Guidelines §15060, has determined that the Project is a discretionary project as defined under CEQA Guidelines §15357, and has determined that in addition to the exemptions identified in the County's NOE, the administrative record supports applicability of other exemptions per CEQA Guidelines §15301, 15302, 15303 and 15061(b)(3). These exemptions reinforce the County's determination that the project is exempt from CEQA and do not require further environmental review.

Public Comment #6 (Leadership):

District incorrectly assumed minimal public concern for project.

District Response to Public Comment #6:

The District acknowledges that this project has generated community interest and concern. The District's permitting review, however, is based on the project's emissions, health impacts, and compliance with applicable permitting requirements. As reflected in the engineering evaluation, the District determined that project-specific stationary source emissions would be below the District's significance thresholds for criteria pollutants, and the health risk evaluation concluded that the project's cancer and non-cancer health impacts would be below applicable District significance levels.

Public Comment #7 (Leadership):

The ERC being proposed in the project is not valid as the emission reductions from the banking action are not permanent. The ERC is also not surplus of all applicable rules.

District Response to Public Comment #7:

The District disagrees that the proposed ERC is invalid. To be eligible for banking, emission reductions must be real, surplus, permanent, quantifiable, and enforceable. ERC Certificate C-1579-1 was generated from the shutdown of a truck trailer coating operation. As described in Appendix K, the original banking action was based on a manufacturing operation that ceased operation, surrendered its permit to operate, and removed the associated equipment from the facility. The emission reductions were quantified based on coating usage, coating VOC content, and application method. The District disagrees that the original banking action failed the permanence requirement merely because similar work could theoretically occur elsewhere; the banking action was based on the shutdown and removal of the permitted source operation that generated the reduced emissions. Accordingly, the District concluded that the original banking action generated valid bankable emission reductions.

For this permitting action, the District separately evaluated whether ERC Certificate C-1579-1 remains surplus of all applicable District and federal requirements at the time of use. Appendix K concludes that no discounting is required because the underlying emission reductions remain surplus of the applicable rules and regulations evaluated in that analysis.

With respect to the coating-rule arguments raised in the comment, the District reviewed the original banking basis and the current surplus status under the applicable surface-coating rules. The original banking action was based on coatings with a VOC content of 2.8 lb/gal, and the District determined that this remains surplus of the applicable current requirements evaluated in Appendix K. The District further

determined that no discounting was required for Rule 4612. Accordingly, the District concluded that ERC Certificate C-1579-1 remains valid and surplus for use in this project.

Public Comment #8 (Leadership and Luis Casablanca):

Safety is a concern as hydrogen infrastructure is built out. The issuance of ATCs for hydrogen projects should be discontinued until specific rules for their operations are adopted.

District Response to Public Comment #8:

The District acknowledges the commenters' concern regarding safety and the broader development of hydrogen-related projects. This permitting action, however, concerns a specific project at an existing refinery that recovers hydrogen from existing refinery processes for use in fuel cells or other refinery operations. The District's review in this proceeding is limited to the project's air emissions, health impacts, and compliance with applicable air permitting requirements.

The District does not agree that issuance of Authorities to Construct for projects involving hydrogen must be suspended unless and until hydrogen-specific District rules are adopted. The District evaluates each project under the rules and permitting requirements currently applicable to the equipment and emissions involved. As reflected in the engineering evaluation, the District reviewed the project for emissions, health risk, offsets, and applicable permitting requirements and concluded that compliance with all applicable rules and regulations is expected.

With respect to site-specific operational safety, those matters are generally governed by other regulatory authorities, including occupational and process-safety requirements outside the District's air permitting authority. The District will continue to review existing and emerging technologies, including projects involving hydrogen, through its applicable air permitting framework in support of air quality planning and attainment efforts.

Public Comment #9 (Leadership and Luis Casablanca):

The issuance of an ATC violates Arvin/Lamont AB 617 Community Emissions Reduction Plan (CERP). The Community Steering Committee for the AB 617 community of Arvin/Lamont has ongoing concerns about the short- and long-term health impacts from this project and Kern Energy's flaring, sulfur odors, the addition of diesel truck transportation of hydrogen, and previously issued Notices of Violation (NOV).

District Response to Public Comment #9:

The District disagrees that issuance of the proposed ATC would violate the Arvin/Lamont AB 617 Community Emissions Reduction Program (CERP). The CERP is a community-driven plan developed under AB 617 to identify and implement emission reduction, enforcement, outreach, and partnership strategies within the community. It does not establish a separate permitting standard for facilities located in the community or alter the District's obligation to evaluate ATC applications under the applicable state, federal, and District permitting requirements.

The District recognizes that the Arvin/Lamont CSC and community members have ongoing concerns regarding Kern Energy, including concerns about flaring, sulfur odors, truck traffic, and the facility's compliance history. The CERP itself identifies industrial sources and heavy-duty trucks among the community's sources of concern and includes measures such as enhanced inspections, truck-related incentive and rerouting efforts, stationary source rulemaking, and expedited AB 2588 review to address those concerns.

This permitting action, however, concerns a specific project, and the District's review is limited to the project proposed in the application. As evaluated in the engineering evaluation, this project does not involve flaring or sulfur emissions, and the project as proposed does not include diesel truck

transportation of hydrogen. With respect to potential health impacts, the District completed a health risk review using approved methods and concluded that the project's cancer and non-cancer health impacts are below applicable District significance levels.

With respect to the commenters' concerns regarding existing facility operations and Notices of Violation, those matters are addressed through separate compliance, enforcement, and AB 2588 processes. For this permitting action, the District independently reviews facility compliance status as part of its major source permitting review. If unresolved violations exist, the District must determine before permit issuance that the underlying issues have been corrected and the facility has returned to compliance, or that the facility is operating under a binding compliance schedule that addresses the issue. Historical violations that have been resolved do not, by themselves, preclude issuance of a new permit. The District reviewed the facility's compliance status as part of this project and found that the facility is currently in compliance with all applicable emission limitations and standards, i.e., there are no existing uncorrected Notices of Violation.

Public Comment #10 (Leadership and Luis Casablanca):

The District is responsible for conducting and reporting a facility risk assessment audit per SB 2588. The District should conduct a reassessment of cumulative air toxics that can result from the co-operation of oil refining, hydrogen recovery, hydrogenation and dehydrogenation processes.

District Response to Public Comment #10:

The District implements AB 2588 (Air Toxics "Hot Spots") in accordance with state law and CARB guidance for existing facilities. Under that program, facility-wide toxic emissions are reported and evaluated based on actual emissions from existing operations. The facility's AB 2588 review was completed in 2025 and resulted in an intermediate-risk status, which requires continued periodic update summary submittals under the program. Consistent with the AB 2588 process, the results were reported through the District's annual air toxics reporting.

The District does not agree that AB 2588 requires a separate cumulative facility risk reassessment as part of this ATC proceeding based on potential emissions from equipment that has not yet been installed. AB 2588 addresses existing-facility emissions, while this permitting action separately evaluated the proposed project's potential health impacts through the District's permitting risk review process. For this project, the District completed a health risk review using approved methods and concluded that the project's cancer and non-cancer health impacts are below applicable District significance levels.

Actual emissions from the project, once installed and operating, would be reflected in future facility-wide emissions reporting and evaluation under the AB 2588 program, as applicable.

Public Comment #11 (Leadership):

The VOC emission calculations are not accurate as they are based on outdated calculation methodology. The operational and leak measuring practices are no longer relevant. Studies using data collected by oilfield companies should not be used by regulators. Suggestion to use OOOOb/c calculation methodology. The Correlation Equation should not be used for new construction.

District Response to Public Comment #11:

See Response to Public Comment #2 regarding the District's use of the correlation-equation framework and the inapplicability of 40 CFR Part 60, Subparts OOOOb and OOOOc to this refinery project.

With respect to the commenters' assertion that the underlying leak-measurement practices are no longer relevant, EPA Method 21 remains a current EPA method for determining VOC leaks and continues to be referenced in EPA's regulatory materials for leak detection. The District's analysis relied on agency

guidance documents, including the California Implementation Guidelines and EPA's equipment-leak framework, rather than on raw unreviewed source data. The California Implementation Guidelines themselves reflect CAPCOA/CARB review of the EPA 1995 protocol and California-specific corrections and adjustments to that methodology.

To the extent the comment argues that the Correlation Equation should not be used for new construction, the District's response is the same as stated in Response to Public Comment #2: for this preconstruction analysis, the District used the CAPCOA-revised correlation equations and factors together with projected component counts to estimate fugitive VOC emissions from the new unit. Because the project involves a new emissions unit, actual component-specific screening data do not yet exist, so the District used assumed screening values for the preconstruction estimate, as reflected in Appendix C, and the new components will be monitored under the facility's fugitive monitoring program after installation. The District concludes that this was a reasonable method for preparing a preconstruction emissions estimate for the proposed unit.

Public Comment #12 (Leadership):

The existing permit units that are involved with the project (platformer, reformer and tanks) should be undergoing a permit modification under District Rule 2201.

District Response to Public Comment #12:

The District disagrees that the existing permit units identified in the comment are modified emissions units under this project. The engineering evaluation states that no changes to the components associated with the Naphtha Reformer Unit (S-37-119) or the Platformer Unit (S-37-4) are expected as part of this project. The project instead adds a new hydrogen recovery unit and associated new piping and components, and those new components were evaluated in the engineering review.

With respect to the tanks, the project uses existing permitted organic liquid storage tanks to store toluene and methyl cyclohexane (MCH). Those tanks are existing organic liquid storage tanks that continue to serve a storage function and remain subject to their existing permit requirements and vapor control requirements. The District did not determine that this project proposed a change to the permitted operation of those existing tanks that would make them modified emissions units for purposes of this permitting action.

Public Comment #13 (Leadership):

What are the changes to the refinery process and electrical system that will receive the final products of hydrogen and electricity?

District Response to Public Comment #13:

The District did not identify any modification to existing refinery process units or the refinery electrical system, other than the addition of the new hydrogen recovery unit, associated new piping, and the new fuel cells included in this project. As described in the engineering evaluation, existing hydrogen from refinery processes will be routed by new piping to the hydrogen recovery/fuel cell system, and no changes to the components associated with the Naphtha Reformer Unit or the Platformer Unit are expected as part of this project. The electricity produced by the new fuel cells will be used to support refinery power needs.

Public Comment #14 (Leadership):

The process description for the new permit does not detail the interactions between existing permit units nor how the proposed equipment works, specifically the Hydrogen Purification Unit, Hydrogenation System, the Dehydrogenation System and the fuel cells.

District Response to Public Comment #14:

The District disagrees that the process description is inadequate for purposes of this permitting action. The engineering evaluation describes the project's two operating modes and explains how hydrogen produced in the existing refinery processes is purified and then either: (1) chemically bound to toluene through the hydrogenation process, stored as methyl cyclohexane (MCH), and later released through the dehydrogenation process for use in the fuel cells or refinery operations; or (2) sent directly from the hydrogen purification equipment to the fuel cells for electricity production. The evaluation also identifies the fuel cells as PureCell Model 400 units and explains that they are used to support refinery power needs. In addition, the evaluation states that no changes to the components associated with the Naphtha Reformer Unit or the Platformer Unit are expected as part of this project.

Public Comment #15 (Leadership):

The Pre-Project Stationary Source Potential to Emit (SSPE1) was not calculated in detail for all permit units.

District Response to Public Comment #15:

The District disagrees that SSPE1 was not calculated in detail. The evaluation identifies the SSPE1 and SSPE2 totals in the body of the document, and the detailed permit-unit values supporting those totals are provided in Appendices G and H. While the evaluation does not restate a separate narrative calculation for each permit unit in the main text, the underlying calculations for the new permit unit were included in the appendices and are sufficient for this permitting action.

Public Comment #16 (Leadership):

Suggestion to use OOOOc in Top-down BACT analysis that would result in a leak threshold of zero ppm rather than the 100 ppm and 500 ppm thresholds approved for the project.

District Response to Public Comment #16:

The commenter misinterprets Subpart OOOOc as establishing a zero-ppm leak threshold. Subpart OOOOc does not define leaks at zero ppm. Rather, when Method 21 is used, Subpart OOOOc defines an instrument reading of 500 ppmv or greater above background as a leak, and a repaired component is confirmed by a Method 21 reading of less than 500 ppmv above background.

Accordingly, Subpart OOOOc does not support the commenter's assertion that the top-down BACT analysis should have used a zero-ppm leak threshold. For this project, the District applied BACT leak definitions of 100 ppmv above background for valves, flanges, and connectors, and 500 ppmv above background for pumps and compressor seals, consistent with the applicable BACT guidelines identified in the engineering evaluation. The 100 ppmv threshold applied to valves and connectors is more stringent than the 500 ppmv threshold referenced in Subpart OOOOc.

Public Comment #17 (Leadership):

The engineering evaluation fails to evaluate compliance with the following rules: District Rules 4454 and 4455, 40 CFR Part 60, Subpart GGG and GGGa, and 40 CFR Part 63, Subpart CC.

District Response to Public Comment #17:

The District disagrees that the engineering evaluation failed to address the cited rules. Each of the identified rules is discussed in Section VIII, Compliance Determination, of the engineering evaluation.

With respect to District Rules 4454 and 4455, the engineering evaluation explains that the project is subject to those rules and identifies permit conditions and existing facility-wide requirements that ensure continued compliance.

With respect to 40 CFR Part 60, Subparts GGG and GGGa, the engineering evaluation addresses those requirements and states that Kern Energy has an inspection and repair program for applicable refinery components. The facility is subject to 40 CFR Part 60, Subparts GGG and GGGa for certain existing operations; however, this particular project is not subject to these subparts. This has been clarified in the final version of the application review.

40 CFR Part 63, Subpart CC applies to major hazardous air pollutant (HAP) sources. Kern Energy is not a major HAP source because the facility's total stationary source emissions are limited by permit condition to less than 10 tons in any consecutive 12-month period of any single HAP and less than 25 tons in any consecutive 12-month period of any combination of HAPs. Actual emissions inventory records demonstrate compliance with these limits. Therefore, Kern Energy is not subject to this NESHAP.

Public Comment #18 (Leadership):

The District did not provide documentation showing Kern Energy has the ability to engage in hydrogen energy production by land use right or through a conditional use permit.

District Response to Public Comment #18:

See Response to Public Comment #5 for the response.

Public Comment #19 (Leadership):

The Health Risk Assessment listed in Appendix F states that the following are attachments: Modeling request from the project engineer; Additional information from the applicant/project engineer; Prioritization score w/ toxic emission summary; and Facility Summary. However, they are not listed in the document. Request to include these four documents in the public notice package.

District Response to Public Comment #19:

The commenter is correct that Appendix F identifies four supporting attachments to the Health Risk Assessment memorandum, and those attachments were not included in the public notice package. Public notice requirements require disclosure of the proposed action and the basis for the District's preliminary decision, but do not require inclusion of all underlying technical working documents. The District conducted a Health Risk Assessment (HRA) consistent with Office of Environmental Health Hazard Assessment (OEHHA), and the engineering evaluation and Appendix F provide the methodology, assumptions, and results relied upon for the District's review. The supporting technical documents referenced in Appendix F are part of the administrative record and are available for public review upon request.

Public Comment #20 (Leadership):

The proposed ERCs are not permanent emissions reductions nor surplus of any applicable regulatory requirement. The original Fresno County Rule 460.3 limit and language are not available for review. The evaluation does not include what type of coating was being applied.

District Response to Public Comment #20:

See Response to Public Comment #7 regarding the District's conclusion that ERC Certificate C-1579-1 is based on permanent emission reductions and remains surplus of applicable regulatory requirements. In response to the commenter's additional concern regarding the original rule basis, Appendix K has been supplemented to include Fresno County Rule 460.3 for review. The District also reviewed the original banking information regarding the coatings used and determined that the banking action was based on coatings with a VOC content of 2.8 lb/gal. Based on that information and the surplus analysis in Appendix K, the District concluded that no discounting of the ERC is required and that the ERC remains valid and surplus for use in this project.

Public Comment #21 (Leadership):

The permit exemption determination must be included in the evaluation.

District Response to Public Comment #21:

See Response to Public Comment #4. As discussed there, the engineering evaluation identifies the fuel cells, states that manufacturer information indicates zero emissions for NO_x, SO_x, CO, and VOC, and explains that the fuel cells are permit exempt because emissions are less than 2.0 lb/day for each pollutant. The fuel cells were nevertheless listed on the new hydrogen recovery unit permit for clarification purposes.

Public Comment #22 (Leadership):

The appendices list PE2 incorrectly.

District Response to Public Comment #22:

See Response to Public Comment #1 regarding the correction of the PE2 values in the appendices.

Public Comment #23 (Jennifer Martinez):

There was no community consultation for this project. The public hearing had to be requested by the public rather than a part of established District procedures. There were no hybrid options available for attending the public hearing.

District Response to Public Comment #23:

See Responses to Public Comments #3 and #6 regarding public notice, language access, and community concern. The District processed this project in accordance with the applicable state and federal air permitting public notice procedures contained in the District's federally approved permitting rules. In accordance with the District's standard public notice procedures, the notice was posted on the District's website and distributed to interested persons who had subscribed to receive public notices by email, text message, or standard mail.

For this type of permitting action, the public has the right to request a hearing, and a public hearing was scheduled after such a request was made. The District also notified the Arvin/Lamont Community Steering Committee of the hearing, provided simultaneous interpretation services and Spanish-language materials at the hearing, and extended the public comment period to allow for additional community engagement.

With respect to the hearing format, the hearing was held in person, in the community, at a location, date, and time coordinated with the parties requesting the hearing in order to facilitate participation by community members.

Public Comment #24 (Jennifer Martinez):

The environmental and health risk assessments were not serious enough.

District Response to Public Comment #24:

The District disagrees that the environmental and health risk reviews for this project were inadequate. The District conducted its permitting review in accordance with the applicable air permitting requirements, including evaluation of the project's emissions, health impacts, and compliance with applicable rules and regulations. With respect to health risk, the District completed a project-specific risk management review using approved methods and concluded that the project's cancer and non-cancer health impacts are below applicable District significance levels. See response to Public Comment #10 regarding AB 2588 and facility-wide toxics review, and response to Public Comment #5 regarding CEQA-related issues.

Public Comment #25 (Jennifer Martinez):

This project was not discussed with the AB 617 Arvin/Lamont Community Steering Committee.

District Response to Public Comment #25:

See Response to Public Comment #3. The District processed this project in accordance with the applicable state and federal air permitting public notice procedures contained in the District's federally approved permitting rules. In accordance with the District's standard public notice procedures, the notice was posted on the District's website and distributed to interested persons who had subscribed to receive public notices by email, text message, or standard mail. The District notes that AB 617 community engagement and the permitting public notice process are distinct processes. The applicable permitting notice requirements for this project did not require presentation of the project to the AB 617 Arvin/Lamont Community Steering Committee before issuance of the public notice. After a public hearing was requested, the District notified the Community Steering Committee of the hearing and extended the comment period to allow for additional community engagement.

Public Comment #26 (Jennifer Martinez and Yesenia G.):

The residents of the community surrounding Kern Energy are exposed to benzene, hydrogen sulfide, ammonia, and nitrogen dioxide on a near daily basis. The exposure threatens the community. The District is not effectively preventing exposure from these hazards and does not require additional fence-line monitoring.

District Response to Public Comment #26:

The District recognizes that community members have concerns regarding ongoing exposure to air pollutants associated with existing refinery operations, including pollutants detected through existing monitoring programs. Those concerns are addressed through separate compliance, enforcement, fence-line monitoring, and AB 2588 processes applicable to existing operations. See Responses to Public Comments #10 and #24 regarding existing-facility toxics review and project-specific health risk review, respectively.

Petroleum refinery fence-line monitoring is required under District Rule 4460, which establishes continuous monitoring requirements for specified air pollutants at refinery boundaries. That monitoring program applies to the facility independently of this permitting action.

For this project, the District evaluated the proposed emissions and health impacts and concluded that project-specific stationary-source emissions are below applicable significance thresholds and that the project's cancer and non-cancer health impacts are below applicable District significance levels. In addition, the new piping components and associated refinery components are subject to fugitive emissions control requirements, including inspection and repair requirements under the applicable leak detection and repair program.

Additional fence-line monitoring for this project was not required, as no applicable rule or permitting requirement was triggered that would require monitoring beyond the existing requirements of District Rule 4460.

Public Comment #27 (Jennifer Martinez, Gina Lopez, Sandra Angel, Anonymous, Ribelino Oros, and Lucia Alcala):

Hydrogen leaks are dangerous and highly explosive. Additionally, the hydrogenation and dehydrogenation processes present risks as well. The District did not address these dangers in their evaluation.

District Response to Public Comment #27:

See Response to Public Comment #8 regarding the District's consideration of safety-related concerns associated with hydrogen projects. The District acknowledges the commenters' concerns regarding potential hazards associated with hydrogen, including leaks and process-related risks. The District's review of this permitting action, however, is limited to evaluation of the project's emissions, health impacts, and compliance with applicable air permitting requirements. Site-specific process safety, emergency response, and operational hazard considerations are regulated by other agencies and regulatory programs outside the District's air permitting authority.

See Response to Public Comment #4 regarding the storage and handling of toluene and methylcyclohexane (MCH) in existing permitted storage tanks.

Public Comment #28 (Jennifer Martinez, Anonymous and Minerva Contreras):

The refinery must develop emergency response and evacuation plans.

District Response to Public Comment #28:

The District acknowledges the commenters' concern regarding emergency response and evacuation planning. The District's evaluation of this permitting action is limited to air quality and associated public health impacts. Emergency response planning and process safety requirements are regulated by other agencies, including EPA, OSHA, and CalEPA programs, and are outside the scope of the District's air permitting authority.

Public Comment #29 (Jennifer Martinez and Yesenia G.):

Our water is contaminated and it is exacerbated by Kern Energy.

District Response to Public Comment #29:

The District's evaluation of this permitting action is limited to air quality and associated public health impacts. Issues related to groundwater or drinking water contamination are regulated by other state and local agencies and are outside the scope of the District's air permitting authority.

Public Comment #30 (Jennifer Martinez):

The health risk management review is not explained in sufficient detail.

District Response to Public Comment #30:

The District disagrees that the health risk management review is not sufficiently explained. The engineering evaluation and Appendix F describe the methodology, assumptions, and results of the Health Risk Assessment conducted for this project using approved methods. That review concluded that the project's cancer and non-cancer health impacts are below applicable District significance levels. Also, see Responses to Public Comments #10 and #24 regarding existing-facility toxics review and project-specific health risk review, respectively.

Public Comment #31 (Anonymous):

Will this project allow Kern Energy to refine crude oil for a longer period of time?

District Response to Public Comment #31:

This project does not authorize or extend crude oil refining operations at the facility. The project leverages hydrogen that is already produced by existing refinery processes and uses it to generate electricity in hydrogen fuel cells or for other refinery operations. The project does not increase crude oil refining capacity or change the permitted operation of existing refinery process units.

Public Comment #32 (Minerva Contreras):

The District's evaluation is too difficult to understand.

District Response to Public Comment #32:

The District acknowledges that engineering evaluations can be complex. The analysis performed by the District is designed to ensure compliance with federal, state, and local air quality requirements, which require the use of technical terminology and regulatory language. To assist with public understanding, the District provided presentations and supporting materials at the public hearing, made staff available to answer questions regarding the project, and provided a project summary in both English and Spanish.

Public Comment #33 (Lucia Alcalá):

The residents of the community surrounding Kern Energy have been requesting the District to reduce emissions from the refinery.

District Response to Public Comment #33:

The District regulates emissions from refinery operations through its permitting and rulemaking programs. Constructing, altering, replacing, or operating any source operation that emits or may emit air pollutants requires an Authority to Construct (ATC) or Permit to Operate (PTO). Upon receipt of an application, the District evaluates whether the project meets all applicable federal, state, and local rules and regulations. The District is required to issue an ATC or PTO for a proposed project that demonstrates compliance with all applicable rules and regulations.

In addition, existing operations are subject to a comprehensive set of prohibitory rules that are periodically updated and made more stringent over time as required by law. These rules require facilities, including Kern Energy, to comply with increasingly stringent emission limits, monitoring requirements, and, where applicable, installation of control technologies to reduce emissions.

Public Comment #34 (Leadership Supplemental²):

The District is required under CEQA to step in as lead agency to conduct an environmental review.

District Response to Public Comment #34:

See Response to Public Comment #5.

Public Comment #35 (Leadership Supplemental):

An adequate emergency plan is missing.

District Response to Public Comment #35:

See Response to Public Comment #28. The District's evaluation of this permitting action is limited to air quality and associated public health impacts. Emergency response planning and process safety requirements are regulated by other agencies, including EPA, OSHA, and CalEPA programs, and are outside the scope of the District's air permitting authority.

Public Comment #36 (Leadership Supplemental):

The jobs created by this project are not going to local workers.

² Comments received within a supplemental letter sent jointly representing Leadership Counsel for Justice & Accountability, Center on Race, Poverty & the Environment, and Comité Progreso de Lamont (Leadership Supplemental)

District Response to Public Comment #36:

The District's evaluation of this permitting action is limited to air quality and associated public health impacts. Employment, hiring practices, and workforce considerations are outside the scope of the District's air permitting authority.

Public Comment #37 (Jesus Perez):

I support this project & request that SJVAPCD grant them the permits requested by Kern Energy without further delays or studies imposed.

District Response to Public Comment #37:

The District acknowledges the commenter's support for the project. After review of the application and all comments received, the District issued the Authority to Construct (ATC) in accordance with applicable federal, state, and District rules and regulations.

Public Comment #38 (CHBC³):

The District's analysis is limited to air quality impacts from the project. This project does not produce hydrogen, but purifies and uses hydrogen already generated onsite.

District Response to Public Comment #38:

The District agrees with the commenter. The District's analysis for this permitting action is limited to air quality impacts. As described in the engineering evaluation, the project does not produce hydrogen, but instead purifies and utilizes hydrogen that is already generated onsite as part of existing refinery operations.

Public Comment #39 (CHBC):

This project improves safety at the refinery through the replacement of equipment.

District Response to Public Comment #39:

The District acknowledges the commenter's statement regarding potential safety-related benefits. The District's authority for this permitting action is limited to evaluating air quality impacts and ensuring compliance with applicable air quality rules and regulations. Safety-related considerations, including workplace and process safety, are regulated by other agencies and are outside the scope of the District's permitting authority.

Public Comment #40 (CHBC):

This project will result in nine permanent jobs.

District Response to Public Comment #40:

The District acknowledges the commenter's statement regarding potential job creation. See Response to Public Comment #36 regarding the District's permitting authority, which is limited to evaluating air quality impacts.

Public Comment #41 (CHBC):

This project aligns with California's clean energy transition.

District Response to Public Comment #41:

The District acknowledges the commenter's statement. The District's evaluation of this permitting action focused on the project's air quality and associated public health impacts in accordance with applicable rules and regulations.

³ California Hydrogen Business Council

Public Comment #42 (CHBC):

This project improves refinery operations by lowering combustion-related emissions, reducing grid-related flaring events, and modernizing equipment that handles hydrogen.

District Response to Public Comment #42:

The District acknowledges the commenter's statement regarding potential operational and emission-related benefits of the project. The District's evaluation of this permitting action focused on the project's air quality and associated public health impacts from the installation of the new equipment. The District's review did not include an analysis of electrical grid operations or sources of grid power.

Public Comment #43 (B3K⁴):

The installation of this technology will help Kern Energy reduce its carbon footprint and improve the current facility's efficiency.

District Response to Public Comment #43:

The District acknowledges the commenter's statement regarding potential efficiency and greenhouse gas benefits. The District's evaluation of this permitting action focused on the project's air quality and associated public health impacts from the installation of the new equipment in accordance with applicable rules and regulations.

Public Comment #44 (B3K):

This project will create better-paying jobs in Kern County.

District Response to Public Comment #44:

The District acknowledges the commenter's statement regarding potential job creation. See Response to Public Comment #36 regarding the District's permitting authority, which is limited to evaluating air quality impacts.

⁴ A Better Bakersfield and Boundless Kern: Regional Action for Economic Prosperity, (B3K)

Exhibit D.
Kern Energy's Site Plan Review
Application to the Kern County
Planning and Natural Resources
Department



7724 E. Panama Lane
Bakersfield, CA 93307-9210
www.kernenergy.com
661-845-0761

March 13, 2025

Matt Hall
Kern County Public Works – Planning Department
2700 'M' Street, Suite 100
Bakersfield, CA 93301

Subject: Site Plan Review and CEQA Determination of Exemption
Kern Energy Hydrogen Recovery Unit

Dear Mr. Hall,

Kern Energy is submitting the attached Form 607 Site Plan Review (Attachment A) in request of Kern County Planning Department's review and issuance of applicable Notice of Exemption. Kern Energy operates a petroleum refining facility producing gasoline and various petroleum distillates, including diesel fuel, located at 7724 East Panama Lane, Bakersfield, CA, in Section 25, Township 30S, Range 28E.

Kern Energy has submitted an Authority to Construct (ATC) application to the San Joaquin Valley Air Pollution Control District (APCD) to construct a hydrogen recovery and clean power production unit. The equipment will reduce Kern's carbon footprint by way of producing clean energy to support refinery production, minimizing reliance on utility grid and other power sources. The unit will be located within the existing operating area of the Kern Energy facility Attachment B provides a map showing the location of the proposed hydrogen recovery unit. An operational statement is included as Attachment C.

The construction and operation of this equipment is allowed by right within Kern Energy's M-3 zoned property and is not subject to any land use/discretionary approvals from Kern County. The unit is subject to ministerial approvals such as building permits, which Kern Energy will apply for at the appropriate time. Kern Energy is submitting the attached Application for Special Development Standards, Plot Plan Review to obtain a Notice of Exemption and Kern County's written concurrence on the following:

- No discretionary approval is required from the County for this project since the existing zoning for the project is appropriate; only ministerial approvals (e.g., Building Permits) may be required; and
- This project is exempt by way of the "general rule" in which the project will not have a significant effect on the environment ([CCR §15061(b)(3)].
- This project is also categorically exempt from CEQA under section 15301 of the Health and Safety Code as it encompasses only minor alternations to the existing facility, resulting in minor increases in emissions, with no significant effects.

Kern Energy appreciates your prompt consideration of this matter. Please feel free to reach out to me at (661) 845-0761 or gcastro@kernenergy.com with any questions. We thank you in advance for your assistance with this request.

Best regards,

A handwritten signature in blue ink, appearing to read 'Gabe Castro', is positioned above the printed name.

Gabe Castro
Environmental Manager

Attachments:

- A - Kern County Form 607: Plot Plan Review
- B - Project Plot Plan
- C - Project Description

Attachment A

Kern County Form 607: Plot Plan Review

APPLICATION FOR SPECIAL DEVELOPMENT STANDARDS
PLOT PLAN REVIEW

KERN COUNTY PLANNING AND
NATURAL RESOURCES DEPARTMENT
2700 "M" Street, Suite 100
Bakersfield, CA 93301

*** IMPORTANT ***

Before preparing this application, read completely the "Instructions to Applicant Filing for Special Development Standards Plot Plan Review."

SECTION A - APPLICANT

1. Name of Applicant: Kern Energy
Mailing Address 7724 East Panama Lane
City Bakersfield State CA Zip Code 93307
Telephone: 661-845-0761 Fax: _____ Email mpalmer@kernenergy.com
2. Name of Individual Representative (if not same as above):
Melinda Palmer
Mailing Address (include Zip Code): 7724 East Panama Lane, Bakersfield, CA 93307
Telephone: 661-845-0761 Fax: _____ Email mpalmer@kernenergy.com

SECTION B - PROPERTY OWNER(S)

1. Name of Current Record Property Owner(s) (if not same as above):
Kern Oil and Refining Co., DBA Kern Energy
Mailing Address 7724 East Panama Lane
City Bakersfield State CA Zip Code 93307
Telephone: 661-845-0761 Fax: _____ Email mpalmer@kernenergy.com
2. Approximate Date Interest in Property Was Acquired: 07/1999 (for parcel where new equipment to be installed)
Month/Year

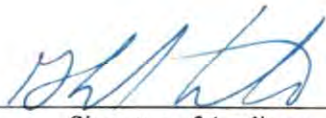
SECTION C - PROJECT LOCATION/DESCRIPTION

1. Street Address of Site (if available): 7724 East Panama Lane
Bakersfield, CA 93307

2. Complete and Accurate Site Legal Description (Copy of Grant Deed may be submitted): _____
Section 25, Township 30, Range 28, Quarter - Contractor Oilfield
Section 30, Township 30, Range 29, Quarter
3. Assessor's Parcel Number(s): 174-130-04 (location of new equipment) Existing operation: 174-130-02, -03, -05; 178-240-14; 178-430-05
4. Square Footage or Acreage of Site: approximately 117 acres
5. Exact Description of the Proposed Project: Construct a 500 BPD demonstration plant which will capture existing hydrogen co-produced within the refining process for use in the production of clean electricity to support refinery power needs.

SECTION D - APPLICANT CERTIFICATION

I hereby certify to the County of Kern that I, Melinda Palmer, am the applicant for this request and that I have read and understand the "Instructions to Applicant" which specify the required development standards. I understand that fees submitted are application filing fees and are nonrefundable. The attachments and information provided on this application are true and correct. I agree to comply with all County Ordinances and State laws relating to building construction and associated improvements.



Signature of Applicant

3-13-2025

Date



Signature of Property Owner of Record

3/13/2025

Date

INDEMNIFICATION AGREEMENT

In consideration by the County of Kern of a permit for a land use approval project located at

7724 East Panama Lane, Bakersfield, CA 93307

(address or general location)

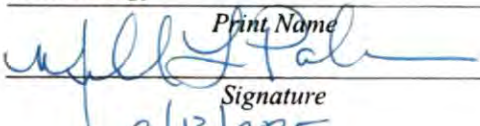
I/We (identified below) agree to indemnify, defend, and hold harmless the County of Kern and its officers, agents, employees, departments, commissioners and boards ("County" herein) against any and all liability, claims, actions, causes of action or demands whatsoever against them, or any of them, before administrative or judicial tribunals of any kind whatsoever, in any way arising from, the Applicant's representations contained within this application, including without limitation any CEQA determination or any related development approvals or conditions, whether imposed by County or not, except for County's sole active negligence or willful misconduct.

This indemnification agreement does not prevent the Applicant or property owner from challenging any decision by County related to this project and the obligations of this condition apply regardless of whether any other permits or entitlements are issued.

County will promptly notify Applicant and property owner (if different than Applicant) of any such claim, action, or proceeding, falling under this condition within thirty days of actually receiving such claim. County, in its sole discretion, shall be allowed to choose the attorney or outside law firm to defend County at the sole cost and expense of the Applicant and/or property owner, jointly and severally, and County is not obligated to use any law firm or attorney chosen by another entity or party.

Applicant/Contact:

Kern Energy

Print Name

Signature
3/13/2025
Date

(If the applicant is not an individual, the corporation's name goes under "Print Name," authorized signature below it, and complete below.)

By: Melinda Palmer

Print Name

Title: Vice President - Regulatory & Public Affairs

IMPORTANT NOTE:

Original signatures of the applicant are required on this form for this application to be considered complete for processing.

OFFICE USE ONLY

Date Filed: _____

Building Permit No.: _____

Receipt No.: _____

Existing Site Zoning: _____

Received By: _____

Flood Study Req'd: ____ Yes ____ No

Zone Map No.: _____

Approved: _____

Date: _____

Denied: _____

Date: _____

Attachment B

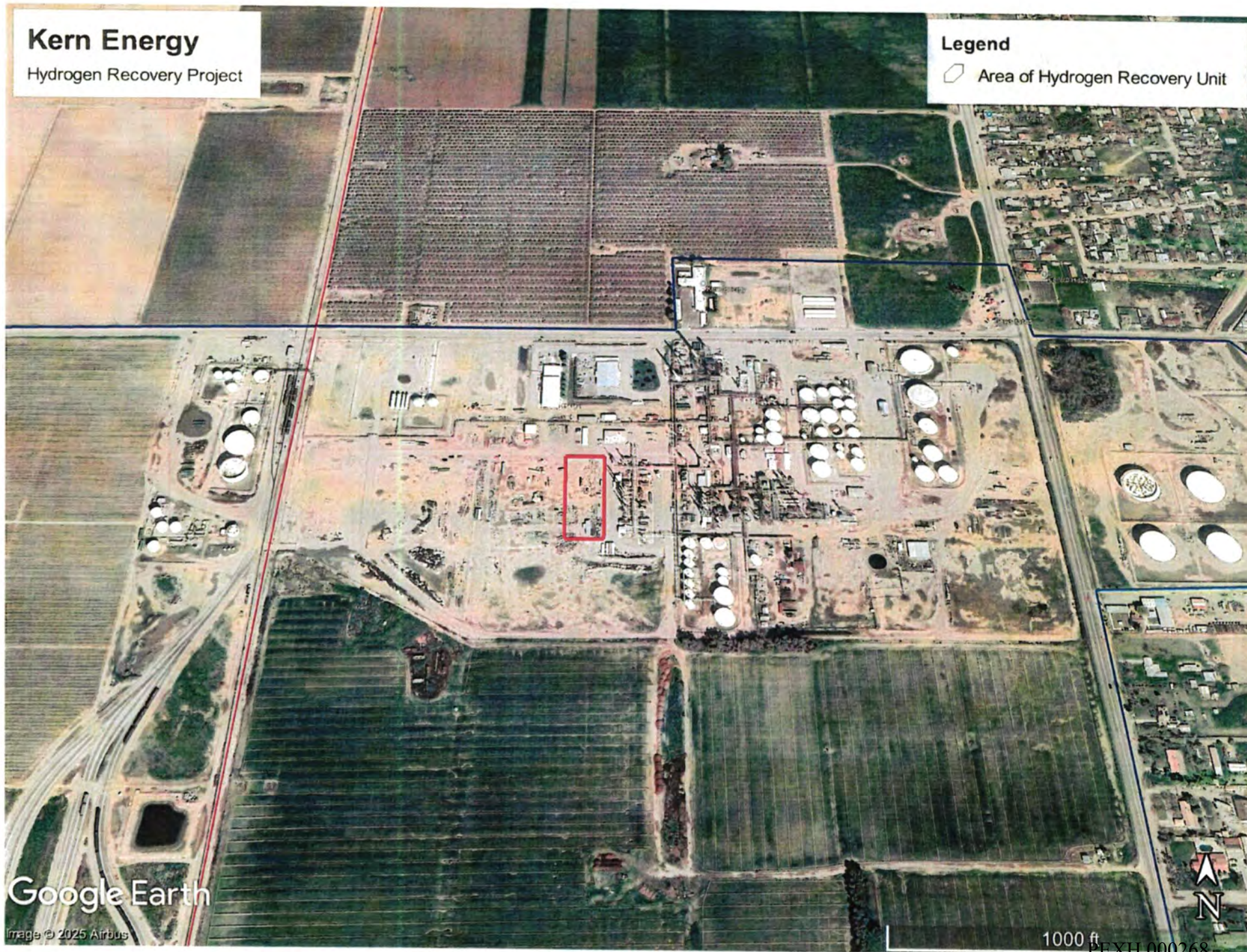
Project Plot Plan

Kern Energy

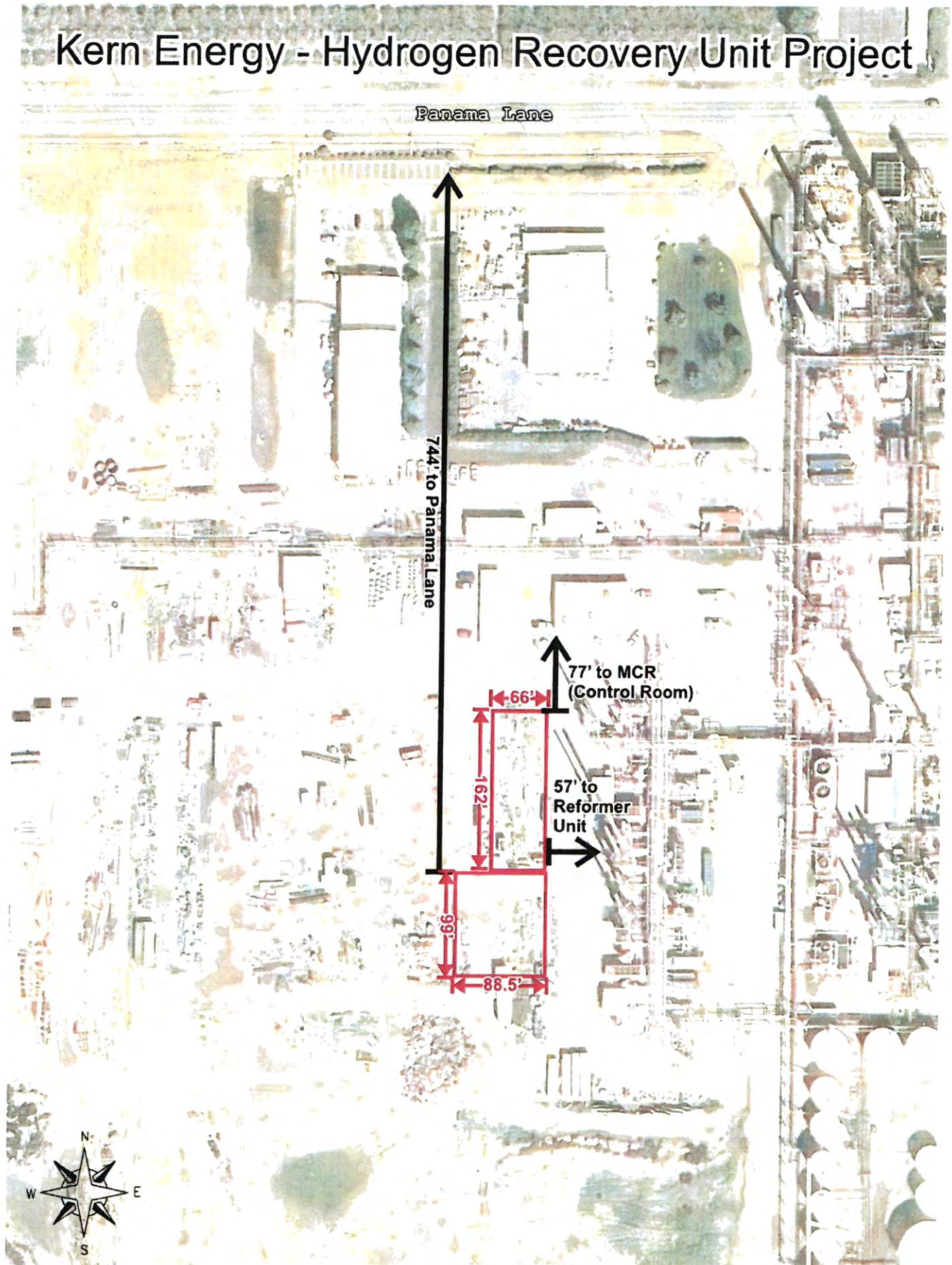
Hydrogen Recovery Project

Legend

 Area of Hydrogen Recovery Unit



Kern Energy - Hydrogen Recovery Unit Project



Attachment C

Operational Statement

Kern County

Planning and Natural Resources Department

Applicant: Kern Energy

Mailing Address: 7724 East Panama Lane
Bakersfield, CA 93307

Project Title: Hydrogen Recovery and Power Production Unit

Project Location: 7724 East Panama Lane
Bakersfield, CA 93307

Contact Name: Gabe Castro

Telephone Number: (661) 845-0761

E-mail: gcastro@kernenergy.com

I. Proposal

Kern Energy (Kern) submits this request for a Plot Plan Review in accordance with Form 607 in order to construct a 500 barrel per day (BPD) demonstration plant which will capture co-produced hydrogen from existing refining processes for use in the production of clean electricity to support refinery power needs.

II. Project Location

The demonstration plant will be located within the Kern Energy facility at 7724 East Panama Lane, Bakersfield, CA. The facility is located in Section 25, Township 30S, Range 28E.

III. Process Description & Operational Statement

Kern operates a petroleum refining operation engaged in the production of gasoline and various petroleum distillates, including diesel fuel. Kern is proposing to install a hydrogen recovery process unit to capture co-produced hydrogen from existing refining processes for use in the production of clean electricity to support the refinery power needs or to be stored in an organic liquid carrier for on-demand release in support of refinery operations.

Operational Statement: Capture and purify existing stream of hydrogen co-produced within existing refining process units for supply to seven fuel cells or stored in an organic liquid carrier for on-demand release to support refinery operations. Equipment includes seven fuel cells and four skids occupying a footprint approximately 100-feet by 90-feet; to be operated 24 hours per day, seven days per week.

IV. California Environmental Quality Act (CEQA)

CEQA requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The San Joaquin County Air Pollution Control District (APCD) adopted its *Environmental Review Guidelines* (ERG) in 2000. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities;
- Identify the ways that environmental damage can be avoided or significantly reduced;
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

District CEQA Findings

The proposed project does not require any zoning modifications, as such the County of Kern (County) has no discretionary approval to issue.

The proposed project is exempt by way of the "general rule" in which the project will not have a significant effect on the environment ([CCR §15061(b)(3)). Additionally, the project can be considered categorically exempt from CEQA, as it encompasses only minor alterations to the existing facilities (CCR Section 15301) resulting in minor increases in emissions, with no significant environmental effects. Of note, the emission increases are less than the SJVAPCD CEQA thresholds and will be mitigated with emission reduction credits at a ratio of 1.5:1.

Kern Energy is seeking the County's concurrence with this determination and anticipates the submission of a Notice of Exemption (NOE) to the APCD.

Pursuant to CEQA Guidelines §15250, the APCD is a Responsible Agency for the Project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CEQA Guidelines §15381). The APCD's engineering evaluation of the ATC will demonstrate compliance with APCD rules and permit conditions will demonstrate that the Stationary Source emissions from the project are at levels below the APCD's CEQA thresholds of significance for criteria pollutants. The APCD does not have authority over any of the other project impacts and therefore will be able to determine that no additional findings are required (CEQA Guidelines §15096(h)).

Planning and Natural Resources Department

2700 "M" Street
Bakersfield, CA 93301
Phone (661) 862-8822
Fax (661) 862-8601

Payment of fees may be subject to:
California Government Code Section 66020 (d)(1)

Customer Name: VIVIANA VANTASSEL

Document Number: 7724 E PANAMA LN / MH

MISCELLANEOUS

CCL001 Policy and Legal Conformance Fee

CCL001 - Policy and Legal Conformance Fee

1 @

\$192.000

\$192.00

3330 OTHER ZONING

COP003 Site Plan Review

COP003 - Site Plan Review

1 @

\$260.000

\$260.00

Order Total**\$452.00**

VISA

\$452.00

Change

\$0.00

674431 Walk-In 3/14/2025 2:18:19 PM BRYAN ANGULO FLORES 1

Lorelei H. Oviatt, AICP, Director
2700 "M" Street, Suite 100
Bakersfield, CA 93301-2323
Phone: (661) 862-8600
Fax: (661) 862-8601 TTY Relay 1-800-735-2929
Email: planning@kerncounty.com
Web Address: <http://kernplanning.com/>



**PLANNING AND NATURAL
RESOURCES DEPARTMENT**

Planning
Community Development
Administrative Operations

April 7, 2025

FILE: SPR 16, Map 124

Kern Energy
Attn: Gabe Castro
7724 East Panama Lane
Bakersfield CA 93307

RE: Site Plan Review, Approval – Hydrogen Recovery and Power Production Unit – APN 174-130-04

Dear Mr. Castro:

This Department has conducted a Site Plan Review in accordance with Chapter 19.80 of the Kern County Zoning Ordinance for the above referenced parcel. The project as proposed is for development of a hydrogen recovery and power production unit and an existing refinery facility in a M-3 (Heavy Industrial zone district.

The submitted site plan is approved for the proposed use.

If it is your intent to request a CEQA Determination of this project, please submit a check for \$50 to this Department and an exemption will be issued.

Should you have any questions regarding this correspondence, please contact Staff directly by telephone at (661) 862-8611 or by e-mail at hallmat@kerncounty.com

Sincerely,


Matthew Hall, Supervising Planner
Energy/Permit Division

PEXH 000274

Kern Energy - Hydrogen Recovery Unit Project

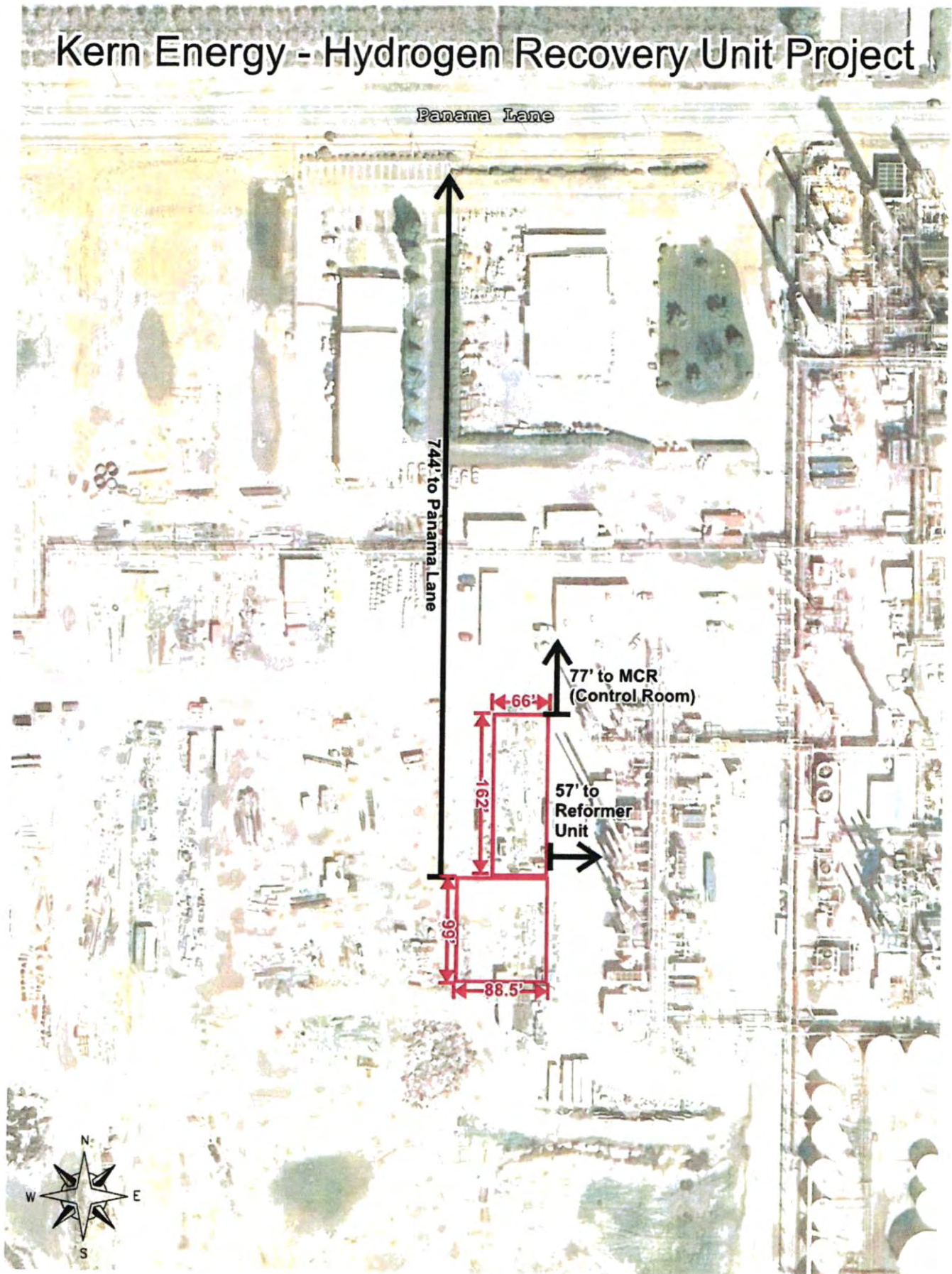


Exhibit E.
Kern County Clerk Environmental
Document for Site Plan Review 16,
Map 124 Kern Energy

RECEIVED WITH FEE
RECEIPT #15151420

CEQA Transmittal #5780

0525-10

RECEIVED
KERN COUNTY

Submitted to
Department 4/29/2025 3:40:28 PM by NEATHERY, AMBER L

MAY 01 2025

Enter CEQA Information

Lead Agency: KERN COUNTY PLANNING AND NATURAL RESOURCES DEPARTMENT

AIMEE X. ESPINOZA

ASSISTANT COUNTY CLERK
BY W. Belmont DEPUTY

Project Title: SITE PLAN REVIEW 16, MAP 124 KERN ENERGY

Project Applicant Name: KERN ENERGY

Phone Number: (661) 845-0761

Address: 7724 EAST PANAMA LANE

City: BAKERSFIELD

State: CA

ZIP: 93307

Posting Period: ☒ 30 Days ☐ 45 Days ☐ Other 30

Project Applicant Type: Private Entity

FILED
KERN COUNTY

MAY 02 2025

Select Fee

☐ Notice of Intent

☐ Notice of Availability BY W. Belmont DEPUTY

☐ Notice of Public Hearing

☐ Notice of Preparation

☐ Mitigated Negative Declaration/Negative Declaration

☐ Environmental Impact Report

☒ Notice of Exemption

☐ Other

☐ No Fish & Wildlife Fee

Total: \$50.00

Proof of Payment

Please enter Proof of Payment: 678455

[View Cashiering \(/Cashiering/Placing%20Orders/OrderSummary.aspx?IsPending=false&ReceiptNo=678455\)](#)

Additional Information

Reference Number:

Notes:

Enter JV Information (if needed)

JV Sequence Number 923285 (/journalvouchers/CreateJV.aspx?jvHeaderId=923285)

OK / CD
4/29/2025

25669

Notice of Environmental Document
Posted by County Clerk on 05/02/2025
and for 30 days thereafter, Pursuant to
Section 21152(C), Public Resources Code

Kern County Clerk
1115 Truxtun Ave
Bakersfield CA 93301
(661) 868-3588

CEQA
County Clerk Fee
#25669

1 @ \$50.000
\$50.00

Total **\$50.00**

JV #923285 \$50.00

Change \$0.00

ORDER NO: 681886
MAIL
5/2/2025 3:56:37 PM
BAKERSFIELD
MARIANNA CEDENO

RECEIVED WITH FEE
RECEIPT # 15151420

NOTICE OF EXEMPTION

From: Kern County Planning and Natural Resources Department
2700 "M" Street, Suite 100
Bakersfield, CA 93301

FILED
KERN COUNTY
MAY 02 2025
AIMEE X. ESPINOZA
AUDITOR-CONTROLLER-COUNTY CLERK
BY L. Oviatt DEPUTY

Project Title: - Site Plan Review 16, Map 124

Project Location -- Specific: APN 174-130-04

Project Location -- City: Unincorporated Kern County

Project Location -- County: Kern

Description of Project: Construction of hydrogen recovery and power production unit at existing refinery.

Name of Public Agency Approving Project: KERN COUNTY PLANNING AND NATURAL RESOURCES DEPARTMENT

Name of Person or Agency Carrying Out Project: Kern Energy

Exempt Status: (Sections 15301, 21080(b)(1) and 15268)

Reasons Why Project Is Exempt: Building Permits are ministerial under Kern County Zoning Ordinance and are exempt under Sections 21080(b)(1) and 15268 of the State CEQA Guidelines

Contact Person: Dennis McNamara, Division Chief, (661) 862-8624

Date Received for Filing:

April 24, 2025

Lorelei H. Oviatt
Lorelei H. Oviatt, AICP
Director

cc: County Clerk
Applicant
Case File

25469

Notice of Environmental Document
Posted by County Clerk on 05/02/2025
and for 30 days thereafter, Pursuant to
Section 21152(C), Public Resources Code
PEXH 000279

Planning and Natural Resources Department
 2700 "M" Street
 Bakersfield, CA 93301
 Phone (661) 862-8822
 Fax (661) 862-8601

FILED
KERN COUNTY

MAY 02 2025

AIMEE X. ESPINOZA
 AUDITOR CONTROLLER-COUNTY CLERK
 BY *Aimee X. Espinoza* DEPUTY

Payment of fees may be subject to:
 California Government Code Section 66020 (d)(1)

Customer Name: KERN ENERGY

Document Number: SPR 16 MAP 124 . MH

5730 TRUST FUND - OTHER

CCF002T County Clerk Fee

CCF002T - County Clerk CEQA Posting

1 @

\$50.000

\$50.00

Order Total

\$50.00

VISA

\$50.00

Change

\$0.00

678455 Walk-In 4/9/2025 4:27:35 PM BRYAN ANGULO FLORES 1

PEXH 000280

SEQUENCE: 923285

COUNTY OF KERN

JV:

FISCAL YEAR: 24-25

INTER-FUND

TOTAL: \$100.00
DESCRIPTION: SPR 16 MAP 124 . MH CC Fee

TRANS CODE	FUND	FUND NAME	DEPT DIV	REV/EXP PY	AMOUNT	MEMO
From:						
3602	24012	APPLICANT DEPOSIT TRUST CC FEE	2750	5730	\$50.00	
To:						
3601	00343	COUNTY CLERKS CLEARING	2118	4681	\$50.00	

EXPLANATION OF PURPOSE AND AUTHORITY THEREFOR:

SPR 16 MAP 124 . MH

REFERENCE: 678455

PREPARED BY: SYSTEM

DEPT: 2118

DATE: 04/10/2025

PROCESSED DATE:

Kern Energy - Hydrogen Recovery Unit Project

Panama Lane

744' to Panama Lane

77' to MCR (Control Room)

57' to Reformer Unit

66'

162'

99'

88.5'

N
S
E
W





State of California - Department of Fish and Wildlife
2025 ENVIRONMENTAL DOCUMENT FILING FEE
CASH RECEIPT
DFW 753.5a (REV. 01/01/25) Previously DFG 753.5a

Print

Start Over

Save

RECEIPT NUMBER

15 — 05022025 — 15151420

STATE CLEARINGHOUSE NUMBER (If applicable)

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY.

LEAD AGENCY	LEAD AGENCY EMAIL	DATE
KERN COUNTY PLANNING AND NATURAL RESOURCES DEPARTMENT		5/2/2025
COUNTY/STATE AGENCY OF FILING	DOCUMENT NUMBER	
Kern	25669	

PROJECT TITLE

SITE PLAN REVIEW 16, MAP 124 KERN ENERGY

PROJECT APPLICANT NAME	PROJECT APPLICANT EMAIL	PHONE NUMBER
KERN ENERGY		(661) 845-0761
PROJECT APPLICANT ADDRESS	CITY	STATE
7724 EAST PANAMA LANE	BAKERSFIELD	CA
		ZIP CODE
		93307

PROJECT APPLICANT (Check appropriate box)

☐ Local Public Agency ☐ School District ☐ Other Special District ☐ State Agency ☒ Private Entity

CHECK APPLICABLE FEES:

☐ Environmental Impact Report (EIR)	\$4,123.50	\$	0.00
☐ Mitigated/Negative Declaration (MND)(ND)	\$2,968.75	\$	0.00
☐ Certified Regulatory Program (CRP) document - payment due directly to CDFW	\$1,401.75	\$	0.00

☐ Exempt from fee

☒ Notice of Exemption (attach)

☐ CDFW No Effect Determination (attach)

☐ Fee previously paid (attach previously issued cash receipt copy)

☐ Water Right Application or Petition Fee (State Water Resources Control Board only)	\$850.00	\$	0.00
☒ County documentary handling fee		\$	50.00
☒ Other		\$	

PAYMENT METHOD:

☐ Cash ☐ Credit ☐ Check ☐ Other

TOTAL RECEIVED \$ 50.00

SIGNATURE

X

AGENCY OF FILING PRINTED NAME AND TITLE

M. CEDENO, KERN COUNTY CLERK, FSS

Exhibit F.
Letter to Kern County Planning and
Natural Resources Department
Regarding Conditional Use Permit
Required for Proposed Hydrogen
Project at Kern Energy (February
16, 2026)



February 18, 2026

Sent Via Email murphyc@kerncounty.com

Craig Murphy
Director Of Planning And Natural Resources Department
Kern County
2700 M Street, Suite 100
Bakersfield, CA 93301

Re: Conditional Use Permit Required For Proposed Hydrogen Energy Project At Kern Energy

Dear Craig Murphy:

Thank you for taking the time to meet with Leadership Counsel for Justice & Accountability (“Leadership Counsel”) staff on January 26, 2026. We appreciate your answers to our questions regarding the proposed hydrogen energy project at Kern Energy (the “Project”). This letter serves as follow up to our outstanding concern regarding the Project’s cogeneration facility. Several organizations who work with residents near Kern Energy, including the Center on Race, Poverty, and the Environment (CRPE), Comité Progreso de Lamont (CPL), and Committee for a Better Arvin (CBA) also join this letter.

I. Background

Leadership Counsel is an environmental and social justice nonprofit that works alongside and supports some of the most impacted communities to advocate for sound policy and eradicate injustice to secure equal access to opportunity regardless of wealth, race, income and place. Leadership Counsel has worked closely with residents of Fuller Acres to implement the Community Air Protection Program mandated by AB 617, establish the Fuller Acres Park, advocate for fair housing policies, and advocate for street lights and reliable access to clean water and sewer service.

CRPE is an environmental justice organization based in Kern County that represents frontline communities dealing with some of the worst pollution and environmental harms, not only in California, but in the Nation. These communities are disadvantaged communities of color and CRPE works closely with them to uplift their voices, fight for their right to live in healthy communities, and advocate for polluters to be held accountable. Hydrogen raises several

concerns for our communities, including environmental concerns and great safety risks for surrounding communities.

CPL works to promote a clean environment and improve the health and education of the community of Lamont, California in Kern County. Hydrogen is a large concern for CPL because of its impacts to water and the safety risks for local residents.

CBA aims to achieve environmental justice by exercising leadership in the Arvin community to protect the quality of water, air, and land for a healthy Arvin and San Joaquin Valley. Hydrogen is a large concern for CBA because of its environmental impacts and safety risks for local residents.

Residents of Fuller Acres, Lamont, and Arvin have expressed significant concern regarding the Project. Specifically, residents are concerned that the Project poses, both on its own and cumulatively with other hydrogen projects, a substantial risk to human health, the threat of increased facility emissions, and the risk of perpetuating oil refining, all without adequately considering the short and long-term impacts on the health of nearby residents. Given these concerns, the undersigned organizations seek to ensure that residents' concerns are addressed and an adequate environmental review of the Project is conducted.

II. Project Requires A Conditional Use Permit And Environmental Review

On October 28, 2025, the San Joaquin Valley Air Pollution Control District (the "District") posted a Public Notice of preliminary decision for the issuance of an Authority to Construct permit. The Engineer's Report and Project Summary prepared by the District indicate that the Project will consist of seven fuel cells, which will produce electrical power and thermal heat.¹ The U.S. Department of Energy² and California Energy Commission³ define cogeneration as the simultaneous generation of electrical power and heat. Thus, the Project constitutes a cogeneration facility.

On May 2, 2025, the Kern County Clerk posted a California Environmental Quality Act (CEQA) Notice of Exemption, alleging that the Planning and Natural Resources Department's approval of the Site Plan Review for the Project was a ministerial action exempt from CEQA review.⁴ However, the ministerial approval of the Site Plan Review was improper because the Project does not conform with M-3 district permitted uses and requires a Conditional Use Permit. Kern Energy is located within an M-3 district and Kern County Municipal Code § 19.40.030(G) requires a Conditional Use Permit for a cogeneration facility within an M-3 district. Further, Kern County Municipal Code § 19.114.020(A) prohibits the issuance of building or grading permits for the Project without the necessary Conditional Use Permit.

¹ See <https://www.valleyair.org/media/43mn5jvp/project-summary.pdf>, page 2; <https://www.valleyair.org/media/1qxfanzh/s1251187-pnp-package.pdf>, page 2; and <https://hyaxiom.com/wp-content/uploads/2025/11/hyaxiom-purecell-model-400-line-of-products-a-road-map-for-transitioning-to-hydrogen-economy.pdf>

² <https://www.energy.gov/eere/ito/combined-heat-and-power-basics>

³ <https://www.energy.ca.gov/data-reports/california-power-generation-and-power-sources/combined-heat-and-power>

⁴ <http://www.kerncountyclerk.com/en/CEQA/ViewImageGoBack.aspx?Id=88027>

Leadership Counsel, CRPE, CPL, and CBA respectfully request that Kern County rescind its prior approval of Kern Energy's Site Plan Review. To proceed with considering the Project for approval, Kern County must first consider an application for a Conditional Use Permit at a properly noticed public hearing pursuant to Kern County Municipal Code Chapter 19.102, Article IV. According to Kern County Planning Commission's Public Hearing Process, the consideration of the Conditional Use Permit must be agendaized as a regular item and members of the public must be provided the opportunity to voice their concerns.⁵ Additionally, Kern County Planning Commission's discretionary review of an application for a Conditional Use Permit is subject to CEQA and must include an environmental assessment.

* * * * *

Thank you for your consideration of this matter. Please keep us updated on any next steps or changes regarding the Project. We look forward to working with you to ensure that the Project does not harm residents of Fuller Acres, Lamont, and Arvin.

Sincerely,

Vivyana Prado
Staff Attorney
Leadership Counsel for Justice and Accountability

Kayla Karimi
Staff Attorney
Center on Race, Poverty, and the Environment

Diana Mireles
President
Comité Progreso de Lamont

Estela Escoto
President
Committee for a Better Arvin

⁵ <https://kernplanning.com/informational-guides/info-guide-public-hearing-process/>

Exhibit G.

**Notice of Preliminary Decision for
the Issuance of Authority to
Construct and the Proposed
Significant Modification of
Federally Mandated Operating
Permit (October 28, 2025)**

**NOTICE OF PRELIMINARY DECISION
FOR THE ISSUANCE OF AUTHORITY TO CONSTRUCT AND
THE PROPOSED SIGNIFICANT MODIFICATION OF FEDERALLY
MANDATED OPERATING PERMIT**

NOTICE IS HEREBY GIVEN that the San Joaquin Valley Air Pollution Control District solicits public comment on the proposed significant modification of Kern Energy at 7724 E Panama Lane Bakersfield, California. The project is to install a hydrogen power generation operation including fuels cells, hydrogen purification unit, hydrogenation and dehydrogenation process units.

The District's analysis of the legal and factual basis for this proposed action, project # S-1251187, is available for public inspection at https://www.valleyair.org/notices/public_notices_idx.html and at any District office. [The emission increase associated with this project is: 585 lb-VOC/year.](#) This will be the public's only opportunity to comment on the specific conditions of the modification. If requested, the District will hold a public hearing regarding issuance of this modification. For additional information, please contact the District at (661) 392-5500. Written comments on this project must be sent or postmarked by December 1, 2025 to publicnotices@valleyair.org or **BRIAN CLEMENTS, DIRECTOR OF PERMIT SERVICES, SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, 34946 FLYOVER COURT, BAKERSFIELD, CA 93308.**

Exhibit H.
**Letter to District Regarding Notice
of Preliminary Decision for the
Issuance of Authority to Construct
Project No. S-1251187 (November
14, 2025)**



November 14, 2025

Sent Via Email publicnotices@valleyair.org

Brian Clements
Director Of Permit Services
San Joaquin Valley Air
Pollution Control District
34946 Flyover Court, Bakersfield, CA 93308

**Re: Notice Of Preliminary Decision For The Issuance Of Authority To Construct
Project No. S-1251187**

Dear Brian Clements:

On October 28, 2025, the San Joaquin Valley Air Pollution Control District ("District") provided notice of the District's intent to issue the Authority to Construct with a Certificate of Conformity for the installation of a hydrogen power generation operation to Kern Energy at 7724 E. Panama Lane, Bakersfield, California.

This letter serves as a formal request for a public hearing regarding the issuance of this permit modification.

Sincerely,

Vivyana Prado
Legal Advocate

Fresno
Headquarters
2210 San Joaquin St.
Fresno, CA 93721

Bakersfield
1527 19th St., Ste. 212
Bakersfield, CA
93301

Coachella
85350 Bagdad Ave.
Coachella, CA
92236

Merced
800 W 20th St., Ste. C-2
Merced, CA
95340

Sacramento
1107 9th St., Ste. 601
Sacramento, CA
95814

**General Contact
Information**
(559) 369-2790
www.leadershipcounsel.org

Exhibit I.

**Letter to District Regarding
Comments on Notice of Preliminary
Decision for the Issuance of
Authority to Construct Project No.
S-1251187 (December 1, 2025)**



December 1, 2025

Sent Via Email publicnotices@valleyair.org

Brian Clements
Director of Permit Services
San Joaquin Valley Air
Pollution Control District
34946 Flyover Court, Bakersfield, CA 93308

Re: Comments On Notice Of Preliminary Decision For the Issuance Of Authority To Construct Project No. S-1251187

Dear Brian Clements:

Thank you for the opportunity to provide comments on the issuance of an Authority to Construct permit for the proposed hydrogen project at Kern Energy, Project No. S-1251187 (the “Project”). While we appreciate the time that the San Joaquin Valley Air Pollution Control District (“District”) took to prepare the Public Notice Package, we are concerned that the Project will further disadvantage the already overburdened communities of Fuller Acres, Lamont, Arvin and nearby disadvantaged unincorporated communities. Specifically, we are concerned that this hydrogen facility poses, both on its own and cumulatively with other hydrogen projects, a substantial risk to human health, the threat of increased facility emissions, and the risk of perpetuating the longevity of crude oil refining, all without adequately considering the short and long-term impacts to these communities. Additionally, the development of hydrogen infrastructure without the requisite research and regulatory framework will result in the quick and dangerous expansion of a hydrogen industry with minimal guardrails.

As a result, we request that the District: (1) revise its Engineering Evaluation; (2) conduct an independent California Environmental Quality Act (CEQA) review of the Project; (3)

authenticate the proposed Emission Reduction Credits (ERCs) to be used for the Project; and (4) refrain from issuing an Authority to Construct permit until an adequate Engineering Evaluation is prepared after independent CEQA review, and a regulatory framework for hydrogen projects is developed.

The undersigned organizations have worked alongside residents of the San Joaquin Valley for many years in support of improving local air quality, securing access to clean water, and more. Most recently, we have worked alongside partner organizations in efforts to reduce emissions and pollution burden for South Kern including Lamont, Weedpatch, and Arvin through the implementation of the AB 617 Community Air Protection Program. Fuller Acres residents are concerned about the health impacts of the Project, impacts to emission reduction targets as defined in the Community Emission Reductions Program (CERP), and whether the Project will actually lead to the San Joaquin Valley achieving its Clean Air Act attainment goals. Residents have requested the opportunity to ask the District questions about the Project and ask to remain updated on all changes, updates, and actions related to the Project. These concerns and requests arise from the District's insufficient Engineering Evaluation, the lack of a project-specific environmental review, and the use of long-dormant ERCs.

I. DISCUSSION

A. Information In Engineering Evaluation Is Inconsistent, Inaccessible, And Incomplete

Before deciding whether or not to issue a permit, the District must complete an Engineering Evaluation in accordance with District Application Review Policy 1010 ("APR 1010"). The District should not make a decision on the issuance of the Authority to Construct permit without a complete and accurate Engineering Evaluation. As described below, the current Engineering Evaluation is not satisfactory and must be revised before the District can properly make a decision on the issuance of the ATC permit.

1. VOC Emissions Data is Inconsistent

The Potential to Emit (PE2) value is inconsistent throughout the Engineering Evaluation. In Appendices H and I, the PE2 for VOCs is represented as 585 pounds per year (lb/year). However, a PE2 value of 483 lb/year is used elsewhere throughout the Engineering Evaluation. There is no data provided to indicate how the value of 585 lb/year was calculated nor why this inconsistency exists. This inconsistency by itself requires revision to the Engineering Evaluation. Further, considering that various calculations throughout the Engineering Evaluation depend on this PE2 value, these other calculations may rely on an incorrect value and incorrectly state the actual VOC emission projections.

Given the technical complexities of the Engineering Evaluation, this inconsistency only makes the information more complicated and confusing to community residents. The Public Package Notice is not adequately conveying the implications of the Project to community residents. As such, the Engineering Evaluation must be revised and recirculated.

2. Assumptions for General Calculations of Emissions Rely on Outdated and Irrelevant Guidelines

The District erroneously relies on the *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities*, published by CAPCOA and CARB in 1999, to calculate projected emissions for the Project.¹ These guidelines are outdated and no longer reliable given that the technology used to measure actual emissions has evolved since the report was published. The District should use guidelines provided by the Environmental Protection Agency (EPA), which are more current, reliable, and accurate. In 2015, the EPA posted *Emissions Estimation Protocol for Petroleum Refineries - Version 3.0*, which provides “guidance and instructions to petroleum refinery owners and operators and to federal, state, and local agencies for the purpose of improving emission inventories for the petroleum refining industry.”² The EPA also developed and maintains WebFIRE, an online data storage and emissions factor retrieval and development tool.³ WebFIRE provides users with data and tools to calculate and assess the representativeness of emission factors based on frequently updated emissions records submitted to the EPA from regulatory agencies, consultants, and industries.⁴ Given the extensive up-to-date resources and guidance available to the District, the District should not continue to rely on the *California Implementation Guidelines* from 1999.

3. Public Notice Package Was not Made Available to the Arvin/Lamont Community Steering Committee or Made Available in Spanish

As a proposed project within the AB 617 Arvin/Lamont Community Air Protection Program boundary, the District should have informed the Community Steering Committee (CSC) about the availability of the ATC packet, provided project details, and requested feedback from the CSC to determine the need for a public hearing. Instead, the District failed to inform the CSC despite leading CSC meetings, and despite knowing the facility is of concern to the community. The AB 617 Community Air Protection Program has not only provided the financial means for the District to conduct meaningful public engagement and information sharing concerning impacts to air quality, but it has also provided the mechanism to allow for collaboration amongst the District, industry, and residents in efforts to reduce emissions. Meaningful and equitable

¹ <https://ww2.arb.ca.gov/sites/default/files/2020-04/CAPCOA%201999.pdf>

² https://www.epa.gov/sites/default/files/2020-11/documents/protocol_report_2015.pdf

³ <https://cfpub.epa.gov/webfire/>

⁴

<https://www.epa.gov/air-emissions-factors-and-quantification/procedures-development-emissions-factors-stationary>

community involvement and engagement is a core pillar of the AB 617 Program.⁵ As such we urge the District to commit to their responsibilities to the AB 617 Program by providing meaningful engagement opportunities to facilitate the participation of residents in the ATC process.

Additionally, meaningful engagement with community residents on the Project requires Spanish translation. A Spanish translation of the Public Notice Package and the Engineering Evaluation will help to ensure the integrity of the public process given that the Project is located in Fuller Acres. Fuller Acres and neighboring communities are predominantly Spanish-speaking communities and experience some of the highest rates of linguistic isolation in California.⁶ The District has previously acknowledged that Spanish translation is necessary to ensure community engagement in Fuller Acres, such as during AB 617 meetings⁷ and in other public notices. By not providing a Spanish translation of all relevant documents, the District is hindering meaningful community engagement. In addition, we urge the District to work with Kern County and Kern Energy, a member of the CSC, to provide monthly updates pertaining to the Project during CSC meetings to allow for continued CSC participation.

4. Technical Details of the Project are Incomplete

The Project consists of two distinct activities: (1) the transfer and storage of organic liquids; and (2) the production of electricity via hydrogen fuel cells. Pertinent technical details are missing from the Engineering Evaluation for both activities. In order to fully evaluate compliance with all statutes and rules applicable to the storage of organic liquids, it is necessary to know the capacity of the organic liquid storage tanks and the precise location(s) of the storage tanks. This information is crucial to determining compliance with Kern County Zoning Ordinance⁸ and with District Rule 4623.⁹ Without this information, the Engineering Evaluation is not complete and a proper CEQA review cannot be conducted.¹⁰

⁵ See Community Air Protection Program Blueprint 2.0,

https://ww2.arb.ca.gov/sites/default/files/2024-04/BP2.0_FULL_FINAL_ENG_2024_04_09.pdf

⁶ Fuller Acres census tract is in the 89 percentile for linguistic isolation; Lamont census tracts are in the 93 and 98 percentiles; Weedpatch census tract is in the 97 percentile; Arvin census tracts are in the 98, 98, and 97 percentiles. Spanish is the top language spoken by linguistically isolated people in these census tracts. See CalEnviroScreen 4.0 Linguistic Isolation, <https://arcg.is/f8Sy40>.

⁷ “To ensure full engagement by CSC members during CERP development, the District assessed language and technology needs... and determined there was a need to provide Spanish interpretation at each of the meetings.” <https://community.valleyair.org/selected-communities/arvin-lamont/cerp-development-implementation/>

⁸ If organic liquid storage tanks have a capacity of 2,000 gallons or greater and are within one-half mile from (1) property zoned for residential use, (2) existing residential development with a density greater than one dwelling unit per acre, or (3) from any motel or hotel, then a conditional use permit and/or a similar use permit must be obtained from Kern County. Kern County Zoning Ordinance §§ 19.08.030 Determination of similar use—Generally; 19.40.020. Permitted Uses; 19.40.030. Uses Permitted With a Conditional Use Permit.

⁹ If organic liquid storage tanks have a capacity of 1,100 gallons or greater, District Rule 4623 is applicable. Modifications to the operation and use of existing organic liquid storage tanks require an analysis of continued compliance with Rule 4623.

¹⁰ See https://www.valleyair.org/media/ktfli5d2/adm_1205.pdf

Further, in order to fully evaluate compliance with all statutes and rules applicable to the production of electricity via hydrogen fuel cells, it is necessary to know the internal functions of the Purecell model 400 fuel cells. Without this information, the emission potential of the fuel cells cannot be confirmed. If, for example, the internal functions involve cogeneration of heat and electricity, this activity will not be in compliance with Kern County Zoning Ordinance without a conditional use permit.¹¹ This information must be added in order for the Engineering Evaluation to be deemed complete.

The Project will modify the operation and use of other existing equipment at the Kern Energy facility. An extensive list of the technical details that are missing from the Engineering Evaluation is provided in Exhibit A.

B. Independent CEQA Review Is Necessary

1. District Has Not Complied with District Policy APR 2010: CEQA Implementation Policy

As an initial matter, the District acknowledges in its CEQA Implementation Policy that issuance of an Authority to Construct permit triggers a statutory requirement to comply with CEQA.¹² This acknowledgment is consistent with case law treating the issuance of Authority to Construct permits as discretionary, triggering CEQA review.¹³

Under the District's CEQA Implementation Policy, environmental review is complete when either:

- (1) A “[p]ublic Agency (e.g. City or County) prepared and certified an environmental review document (e.g. Negative Declaration, Mitigated Negative Declaration, Environmental Impact Report) under CEQA that assessed the impact of the specific ATC project or another project of which it is part of or related to.”; or

¹¹ Cogeneration operations or steam generators require Conditional Use Permits. Kern County Zoning Ordinance § 19.40.030 Uses Permitted With a Conditional Use Permit.

¹² District Policy APR 2010: CEQA Implementation Policy, <https://www.valleyair.org/media/iibmieqr/apr-2010-ceqa-implementation-policy-2024.pdf>

¹³ See, e.g., *Friends of Outlet Creek v. Mendocino County Air Quality Management Dist.*, 11 Cal. App. 5th 1235, 1244-45 [holding that based on the record before the appellate court, the court could not conclude that an authority to construct permit was ministerial, and noting that “neither the air pollution control officer, nor the hearing board, appear to have treated approval of the Authority to Construct as a ministerial act wholly outside CEQA”]; *Cmtys. for a Better Env't v. San Joaquin Valley Unified Air Pollution Control Dist.* (June 23, 2017, No. F073517) ___ Cal.App.5th ___ [2017 Cal. App. Unpub. LEXIS 4323, at *2] [“We conclude that the issuance of the authority to construct permits for the sewer system was a discretionary act.”]

(2) the Authority to Construct project is “specifically exempted from CEQA by a public agency.”¹⁴

Here, the lead agency, Kern County, determined only that its Plot Plan Review was exempt from CEQA. The County has not prepared or certified an environmental document under CEQA, and thus the first prong of the District’s CEQA Implementation Policy is not met. Further, while the County did determine that the Plot Plan Review was exempt from CEQA, the Plot Plan Review is distinct from a project permit under the Kern County Zoning Ordinance.¹⁵ Thus, because Kern County has not specifically exempted the Authority to Construct project from CEQA, the second prong of the District’s CEQA Implementation Policy is similarly not met, and CEQA review is not complete. Issuing the ATC without adequate CEQA review is in violation of CEQA and the District’s own policies.

2. District Incorrectly Assumes that there is Minimal Public Concern for the Project

In the Engineering Evaluation’s CEQA discussion, the District claims that “there is minimal potential for public concern for this particular type of facility/operation.”¹⁶ This determination is inaccurate and fails to consider the Arvin Lamont CERP and resident feedback during the development of the CERP. Contrary to the District’s determination, the District is well aware that Kern Energy is a facility of public concern. In fact, as part of the AB 617 CERP development, the District led an exercise to identify stationary sources of concern for members of the CSC, during which members of the CSC identified Kern Energy as a source of concern.¹⁷ Moreover, the District has not surveyed nor adequately engaged with members of the public about the incorporation of hydrogen operations in the facility or the impacts of such operations. In reality, several Fuller Acres, Lamont, and Arvin residents have indicated to us that they are significantly concerned about the construction and operation of the Project, its implications for their health, potential for explosions, and how it will impact the future of their community.

The District’s assumption that there is minimal concern for the Project is flawed for the further reason that residents have already raised significant public concerns with the expansion of hydrogen projects in Kern County. For example, community residents and advocates of Lost Hills have expressed concern regarding the proposed Chevron Lost Hills Hydrogen Project, particularly with regards to the overburdened environmental justice communities in proximity of

¹⁴ District Policy APR 2010 at p.2

¹⁵ “No permitted use shall be established, no permitted development shall occur, and no building permit or grading permit shall be issued for any permitted use or development subject to this chapter until a plot plan review has been submitted to and approved by the Planning Director in accordance with the procedures set out in Sections 19.102.040 through 19.102.060 of this title.” Kern County Zoning Ordinance § 19.80.040.

¹⁶ Engineering Evaluation, p.24.

¹⁷ San Joaquin Valley Air Pollution Control District Sources of Community Concern
<https://valleyair.mysocialpinpoint.com/arvinlamont-community-engagement#/sidebar/tab/activity>

the hydrogen production, storage, and transportation, the insufficient information available on the Project, and its health and safety implications. The District must correct this underlying assumption and complete a new CEQA review with the approach that community members are significantly concerned about the Project. The District's current flawed assumption undermines the foundational purpose of CEQA and the integrity of public processes in California.

There are considerable environmental and health concerns regarding the Project that warrant a CEQA review. These concerns include the potential for project piecemealing, which may result in the expansion of hydrogen operations at Kern Energy to include transportation of hydrogen through Fuller Acres, Lamont, Arvin and other nearby disadvantaged communities. We are also concerned that long-term crude oil refining will be secured at the facility as a consequence of policy-generated crediting for hydrogen production, which would only frustrate the ultimate goal of improving air quality for nearby disadvantaged communities. Additionally, there is a significant possibility of hydrogen leaks and subsequent explosions.¹⁸ The District must refrain from issuing an ATC permit until a CEQA assessment that addresses these concerns is completed by either Kern County or the District itself.

3. The Project Likely Requires A Discretionary Conditional Use Permit Under The Kern County Zoning Ordinance

The Kern County Zoning Ordinance provides further evidence that CEQA review is required in this instance. Specifically, heat will be generated as an output based on the equipment used by this Project, which indicates that the Project will involve the cogeneration of heat and electricity.¹⁹ "Cogeneration facility or steam generators" require a conduction use permit.²⁰ As such, either prior to or concurrent with the issuance of a building permit, Kern County will need to issue a conditional use permit and comply with CEQA for its discretionary approval.

¹⁸ "Owing to its low molecular weight, hydrogen can easily permeate materials that are not typically considered porous. Upon release, its high energy content can result in ignition events that are more intense than those associated with other common fuels... Hydrogen can cause embrittlement in various metals and deformation in certain polymers, which can lead to leaks in piping and other equipment. Furthermore, hydrogen can be ignited by energy sources 50 times smaller than a typical static electric charge, potentially leading to fires and explosions. Hydrogen has a broad flammability range of four percent to 75 percent in the air. When ignited in its pure form, it burns with a pale blue, nearly invisible flame that emits minimal radiant heat, making detection challenging without thermal imaging cameras. Hydrogen also exhibits a high burning velocity, resulting in rapid combustion of hydrogen-air mixtures and increasing the potential for deflagrations and detonations, which produce damaging pressure waves." *Hydrogen Facilities: laying the Groundwork for Safety Integration into the Built Environment*, <https://www.iccsafe.org/building-safety-journal/bsj-technical/hydrogen-facilities-laying-the-groundwork-for-safety-integration-into-the-built-environment/#:~:text=be%20more%20severe.-,Hazards,which%20produce%20damaging%20pressure%20waves.>

¹⁹ See Exhibit A.

²⁰ Kern County Zoning Ordinance 19.40.030. Uses Permitted With a Conditional Use Permit.

C. Authentication Of Emission Reduction Credits To Be Used For The Project Is Necessary

Kern Energy is relying on Emission Reduction Credits (ERC) Certificate C-1596-1 to offset VOC emissions from the Project. The District states that these ERCs originate from the shutdown of a truck trailer coating operation in 1992. Given that 33 years has elapsed since this certificate originated and the transformation of air quality regulations over time, the ERCs may not be legitimate.

In CARB's 2020 audit of the District's ERC program, it advised the District to be more transparent to the public with regards to the ERC program and to review and revise underlying assumptions as needed.²¹ CARB also identified consistent inflation by the District in the assignment of ERCs to 11 randomly selected orphan shutdown projects.²² The results of this audit warrant our concern that the ERCs to be used to offset VOC emissions from the Project may be inauthentic. Thus, we request prior to the hearing on this project that the District share all documents that certify the origin and authenticity of Certificate C-1596-1 with the public, including records of permitted emissions and actual emissions for the shutdown project.

D. In The Absence Of Regulatory Guidance And Rules Of Specific Applicability, Approval Of Hydrogen Projects Should Be Paused

There are currently several hydrogen projects being evaluated or constructed in Kern County. As hydrogen infrastructure is built out, Kern County and regional regulatory agencies, including the District, must coordinate a plan to adequately regulate infrastructure with consideration of safety concerns and air quality attainment goals. Given that hydrogen is highly flammable and prone to leakage, the production and use of hydrogen at existing gas or oil infrastructure is inappropriate and exacerbates risks to nearby residents. Further, when leaked into the atmosphere, hydrogen also has significant climate impacts.²³ The application of existing District Rules to hydrogen operations is insufficient to ensure safe operations that align with air quality goals. Moreover, current Kern County land use policies and zoning codes do not expressly consider hydrogen operations and the dangers associated with siting operations near residential areas.

Expansion of the hydrogen industry in Kern County without the proper guardrails will inevitably result in harm to frontline communities, such as Fuller Acres, Lamont, and Arvin. Frontline

²¹ CARB, Review of the San Joaquin Valley Air Pollution Control District Emission Reduction Credit System (2020), https://ww2.arb.ca.gov/sites/default/files/2020-06/SJV_ERC_FINAL_20200604.pdf.

²² https://ww2.arb.ca.gov/sites/default/files/2020-06/SJV_ERC_FINAL_20200604.pdf, Table 14.

²³ A recent MIT study demonstrated that hydrogen leaks into the atmosphere increases the concentration of greenhouse gases in the atmosphere, particularly methane and recommends leak prevention be a top priority as hydrogen infrastructure is built. <https://news.mit.edu/2024/new-climate-chemistry-model-finds-non-negligible-impacts-potential-hydrogen-fuel-leak-age-1216>

communities must be included in the development of the regulation of hydrogen projects and the impacts on their health and safety must be taken seriously. In the absence of relevant state or local regulations of emissions from hydrogen facilities and/or District Rules of specific applicability to hydrogen projects, the District should pause approvals on hydrogen projects.

E. Issuance Of Authority To Construct Violates AB 617 Community Emissions Reduction Plan

The California Air Resources Board (CARB) selected the Arvin/Lamont community as one of two communities in year three of the AB 617 Program. The Arvin/Lamont community boundary includes the City of Arvin and the unincorporated communities of Lamont, Fuller Acres, and Weedpatch. As communities with some of the worst air pollution in the San Joaquin Valley Air basin, the goal of selecting Arvin/Lamont as an AB 617 community was to implement community-specific emission reduction measures and community air monitoring networks in efforts to reduce emissions in support of the Valley's attainment goals.

As mentioned above, one of the largest sources of concern is the Kern Energy facility. The CSC has raised various times concerns about large flaring occurring in the middle of the night and during the day, heavy odors of sulfur, and the health impacts of breathing these contaminants including headaches and nosebleeds. The Project will not only exacerbate these conditions, but it could also elongate the operational life of the facility, contributing to indefinite air quality and health implications to frontline communities like Fuller Acres and nearby residents from Lamont and Arvin.

According to the CERP, one of the greatest contributors to localized air quality issues are heavy duty trucks. While the Engineering Evaluation does not adequately describe Project details related to the transport of hydrogen, hydrogen transport is a common activity in hydrogen facilities, thus a major concern for the CSC. The transport of hydrogen by truck will continue the emissions of PM 2.5, NOx and other transportation related emissions. In addition to ongoing emissions, the transportation of hydrogen in any form is highly dangerous due to the high explosion risk from the hydrogen. To comply with CERP measures related to lowering emissions from heavy duty trucks, the District must be transparent about whether the facility will transport hydrogen now or in the future, how the transportation will occur, emissions from the transportation of hydrogen (including construction), and how the emissions will impact emission reduction goals as provided in the CERP.

The addition of hydrogen operations to this facility also raises risks given Kern Energy's track record of violations. Aside from the numerous times the facility has exceeded emission thresholds, according to their fenceline monitoring system, the facility has also been cited for various violations including: Operating 3 engines >50BHP as part of a stationary source prior to

obtaining an ATC; Operating 2 tanks with an organic liquid greater than 0.5 TVP prior to submitting an ATC; Failed monthly monitoring for NOx; Failure to comply with the H2S limits; Exceedance of SOx limit; Exceedance of the 250 ppmvd CO limit as established in ATC1; Violations of Rule 4455 during the annual inspection; >50,000ppm fugitive VOC leaks (5 findings); Open-Ended Lines (15 findings) Failure to comply with 100ppm H2S limit, and more.²⁴ Violations from the facility are ongoing with quarterly enforcement reports showing 14 violations during the first three quarters of 2025.²⁵

The facility's history of violations shows a pattern and practice of failure to follow regulations despite risks to the community and their air quality. These actions are particularly concerning as hydrogen is a fledgling industry for which the District does not have the proper regulatory framework to ensure the operation of the facility will not result in detrimental impacts.

Lastly, as required by law and the CERP, the District is responsible for conducting a Facility Risk Assessment Audit in accordance with SB 2588 to quantify emissions of air toxics, determine the health risk caused by those emissions, report emissions and any significant risks through written public reports and neighborhood public meetings, and take steps to reduce such risks. According to Facility Reassessment Status prepared for the CERP in 2022, the District designated a high priority status to Kern Energy which required the facility to submit a health risk assessment for review to the District and to the Office of Health Hazard Assessment. However, the health risk assessment was not shared with the community. In fact the CVAQ coalition submitted many letters to the District and CARB to request the completion of the facilities reassessments, including the Kern Energy facility. Following CVAQ's requests, the District submitted a memo to CARB in which it designated the Kern Energy facility as intermediate and low, without any further analysis or explanation for the low and intermediate status despite issuing a high priority status in 2022.²⁶ The District must provide the health risk assessment to the CSC and comply with SB 2588. In addition, the District should conduct a reassessment of cumulative air toxics that can result from the co-operation of oil refining and hydrogen recovery, hydrogenation and dehydrogenation process.

* * * * *

Thank you for your consideration of these comments. We look forward to working with you to ensure that the Project at Kern Energy does not harm communities we work alongside.

²⁴Appendix E: Enforcement Plan Attachments Arvin and Lamont CERP

https://community.valleyair.org/media/bufpshwq/appendix-e_enforcement-plan.pdf

²⁵ Enforcement Quarterly Reports

<https://community.valleyair.org/selected-communities/arvin-lamont/reports-and-document-archive/enforcement-reports/>

²⁶ San Joaquin Valley Air Pollution Control District Stationary Source Review. September 15th, 2025.

<https://ww2.arb.ca.gov/sites/default/files/2025-09/2025-09-15%20Memo%20to%20Board%20re%20SJV%20Air%20District%20Stationary%20Source%20Review%20%28with%20Appendix%29.pdf>

Sincerely,

Vivyana Prado
Legal Advocate
Leadership Counsel for Justice and Accountability

Kayla Karimi
Staff Attorney
Center for Race, Poverty, and the Environment

Natalia Ospina
Legal Director
Center for Race, Poverty, and the Environment

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Coalition Coordinator
Central Valley Air Quality Coalition

Estela Garcia
President
Committee for a Better Arvin

Diana Mireles
President
Comité Progreso de Lamont

Exhibit A

ADDITIONAL COMMENTS ON PROJECT NO. S-1251187

1. The VOC emission calculations are both inaccurate and not correct. The emissions must be recalculated and the project must be publicly noticed again given the large amount of changes these new calculations will cause.
 - a. First, we do not believe an emissions estimation methodology based upon 1980-2 emission leak testing by oil and gas companies should be used.
 - Both the operational and leak measuring practices used in the 1980s are no longer similar and associated leaks are no longer relevant to today.
 - Any work completed by oil and gas companies without third party oversight is biased and cannot be used for regulatory emissions calculations work.

In the EPA's 2021 and 2023 proposed rules for Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review, two separate methods for estimating emissions are used. Either of these options is more accurate than what the District is using.

- b. Second, even if we do use the 1999 CAPCOA/CARB, California Implementation Guidelines for Estimating Mass Emissions of fugitive Hydrocarbon Leaks at Petroleum Facilities, the method used is not correct.
 - Method 3 can only be used when the facility has site-specific screening values, and this project says emissions are only being calculated for new pipe. Therefore, Method 3 cannot be used.
 - District Policy SSP-2015 is not accurate, cannot be used, and should be rescinded. First, the policy does not agree with the 1999 CAPCOA/CARB document. All values (default, screening, or purge) are to be site-specific and based upon actual facility measurements. This is behind the whole methodology of Method 3. A District policy cannot cherry-pick an emissions estimate equation and then change how the governing document requires how it be used.
 - Additionally, a 1997 letter from CAPCOA to WSPA saying average emission factors can be used when there are no reliable site-specific data is irrelevant here. This guidance was before the 1999 document, CAPCOA has NO authority in the District issuing proper ATC permits, and every single oil and gas facility that is subject to Rule 4455 is required to take measures that ensures they do have reliable site-specific data.

- Lastly, Method 1 is the method that is to be used when reliable site-specific screen data is not available.

While the above shows Method 3 cannot be used, we still believe the entire 1999 document methodology is out of date and more recent and accurate emission estimation methodologies must be used, with the EPA's 2021 and 2023 options as possible alternatives.

2. We do not believe all permit units being modified by the proposed actions are being evaluated. Rule 2201 and its requirements apply to all new sources AND all modifications. The definition of a modification is also found in Rule 2201 and includes the action of any change in method of operation, which would necessitate a change in permit conditions.
 - a. The Platformer and Chloride Scrubber (S-37-4) and Reformer (S-37-119) are all sending their products somewhere. The proposed action is going to change where and how these products move. We cannot say here exactly how because the District's Process Description is entirely inadequate. Regardless, these two permits are having their method of operation changed by being able to send their products somewhere else. This option must be allowed in the permit, which would be a change in permit conditions.
 - b. The Toluene Tank 3018 (S-37-173) and MCH Tank 3019 (S-37-44) are also being modified by the proposed action. Because of the inadequate Process Description, we do not know how they are currently being used, but the option to transfer and receive toluene and MCH from the proposed process is being added, which is a change in their method of operation. This new process interaction must be added to what these tanks can do, which is a change in permit conditions.
 - c. Lastly, the Appendix B Flow Diagram shows arrows going from the new processes to the Refinery Process and Refinery Electrical System. First, we believe the District must describe how the proposed process and equipment will change these two existing systems in a complete Process Description revision. Second, any other permit units that are being changed at the refinery because of the proposed action must also be included in this project.
 - d. We would add that inaccurate or incomplete permits issued by the District that do not include or do not have proper conditions added is not sufficient justification to say a change is not a modification because a permit condition is not changed or added.
 - e. The information included in Equipment Descriptions on the permit are also permit conditions.

3. As mentioned above, the Process Description for this project is insufficient and must be completely revised. An ATC Permit Application Review is not for the District, it is for the District to prove to everyone else (regulators, the permit requestor, and the public) that the District is permitting properly. Therefore, the entire document should be written with that audience in mind, including the Process Description. The proposed process and equipment are extremely complicated. No one, including CARB and the EPA that are supposed to be reviewing this action, can understand exactly what is occurring here. The District must complete a full Process Description so that those reading this document understand exactly what is being proposed to be permitted. This updated Process Description must include:
 - a. The interactions the proposed process is having with other facility permit units.
 - b. Exactly how the proposed equipment works: the Hydrogen Purification Unit, the Hydrogenation System, the Dehydrogenation System, and the seven 3 MW fuel cells that are being added to the Equipment Description.
4. Per District Rule 2201, the Pre-Project Stationary Source Potential to Emit (SSPE1) must be calculated. Showing an SSPE1 summary table is not calculating it. In all other, regular ATC permit Application Reviews, the District has a section for each permit unit in which the known inputs are listed with their source sited, any assumptions used, and then the calculations are shown just like PE2 in an Application Review. We believe the District must continue to do the same here.

We do see how the District could get around this by the wording found in Rule 2201. However, this is not normal District practice. If the District chooses not to follow regular practice here, we would like the District to explain why and how not calculating SSPE1 is in line with public transparency and protecting public health.

5. The BACT (Best Available Control Technology) Determinations in this project are not correct. In this project, the District is saying there are no emission controls for the various equipment and components (valves, pump seals, connectors, flanges, open-ended lines, and others), and therefore, BACT is the allowable rather of leaking in ppmv.

A BACT Guideline or Top-Down BACT Analysis is required to include all federal rules. 40 CFR Part 60, Subpart OOOOc is Emissions Guidelines for Greenhouse Gas Emissions From Existing Crude Oil and Natural Gas Facilities. This subpart says ANY fugitive emissions, leak, or defects must be repaired, meaning no longer leaking. Therefore, the allowable ppmv for a leak per this current federal regulation is no leak or anything detectible above background. This subpart says all fugitive emissions components are included, regardless of whether they are regulated by this subpart. This subpart title does say Greenhouse Gas, but all rulemaking documents producing this regulation included

both methane and VOCs. Also, methane is an organic compound and for the purposes of determining BACT as an allowable leaking rate of emissions is the same as VOC. Therefore, this lower, allowable rate of emissions as no leak must be used as BACT.

6. We believe this Application Review must show that the new equipment included in this permitting action are complying with all rules and regulations. It is not sufficient to only say it or the facility will continue to comply. A permit unit or the facility-wide permit may already have some conditions for a rule or a regulation, but readers of these documents were not around when those permit conditions were added to existing permits. And, it is not a given that those rules and regulations were originally evaluated properly. If the equipment or operation in this permitting action is subject to a rule or regulation, the District must evaluate the entire rule or regulation in order to show the rules and/or regulations as they stand today are being fully complied with. Therefore, all rules and regulations not fully evaluated must be fully evaluated in this permitting action, including 40 CFR Part 60, Subpart GGG and GGGa, 40 CFR Part 63, Subpart CC (major source determination must be done or included in this project), District Rule 4454, and District Rule 4455.
7. For CEQA, we believe it is the responsibility of the District to ensure a facility is permitted to legally do what the District is issuing an air permit for. Therefore, we would like the District to include information showing Kern Energy has the ability to engage in hydrogen energy production by land use right or has a conditional use permit allowing it.
8. The Appendix F, Health Risk Assessment as included is incomplete. The HRA says there are 4 attachments that are not included in the publicly noticed documents. Without these attachments, the HRA is incomplete and not justified.
9. We believe the ERCs being proposed to be used are not valid and the ERC surplus analysis is incorrect.
 - a. The ERCs being proposed to be used are from the shutdown of a trailer coating operation. We do not believe these ERCs were permanent. ERCs cannot be given simply because a coating operation is shutting down. The original ERC issuing project must have shown that trailer coating was in decline in the Valley and shutting down the operation in question would permanently reduce coating in the Valley. If this was not the case, the trailer coating operation could have shut down but every single trailer that operation would have coated would have gone to another coating operation in the Valley. The same amount of trailers would have been coated and the same amount of emissions would have been emitted, regardless of the facility in question shutting down or not.

We do not believe the District originally did this and we do not believe this was the case. Therefore, the emission reductions were never permanent and should never have been issued. We believe the District must delete the existing ERC certificates and the facility must obtain valid ERCs for this project. We understand the District freely issues ERCs when permit units are shut down regardless of the emission reductions actually being permanent. We are challenging this practice, so responding to this comment as this is District practice for issuing ERCs is not sufficient.

- b. While we do not believe these ERCs are valid, the ERC surplus analysis for them is incorrect.
 - The rules and regulations applicable at the time of the original banking project never state or show the VOC limit of Rule 460.3. Later the analysis says Rule 460.3 was renamed Rule 4603. It is our understanding Rule 460.3 was a county rule from before the District was unified. Once unified, the District would have proposed Rule 4603 and the Governing Board would have approved the rule. Given the age of these rules and the public's inability to obtain them, we would like the District to include the applicable county Rule 460.3 that shows what the VOC limit was.
 - Additionally, the District is using a VOC content limit of 2.8 lb/gal for the original operation. When evaluating rules for time of use, the District is saying the 2.8 lb/gal limit is still applicable and surplus. For Rule 4612, this means the original coating operation documents had to specifically say the operation was only allowed to spray single-stage coating, which has a 2.8 lb/gal VOC limit. If this was not specifically stated (and can be included in an appendix as reference), it must be assumed the coating operation operated like a regular coating operating with primer, clear coating, and then any other coating type. This would mean the current VOC content rule limit is 2.1 lb/gal. This is a reduction of 16%, which means the proposed ERC (which again, is not valid) would need to be reduced by 16%.
10. The Lead Engineer listed on this Application Review is Erin Scott, the Southern Region Permit Department Manager. We are aware Ms. Scott previously worked in the Compliance Department before her current position. We are unaware if Ms. Scott holds an engineering degree, but we do know she has never acted as an Air Quality Engineer, Senior Air Quality Engineer, or a Supervising Air Quality Engineer. We understand a manager or director has the professional experience to review a completed permit before it is issued. However, we believe the purpose of a Lead Engineer on an air permitting action is to use their knowledge and years of experience as a Supervising, Senior, and

regular Air Quality Engineer in order to ensure air permits are issued properly. We believe this important step is being missed with Ms. Scott as the Lead Engineer.

11. If the hydrogen fuel cells are being included on the Equipment Description in this Application Review, then the actual equipment permit exemption evaluation must be done in this project or included in an appendix.
12. The QNEC and SSPE1 Appendices list PE2 inaccurately.

Exhibit J.

**Notice of Public Hearing on
Proposed Preliminary Decision to
Issue Authority to Construct Permit
to Kern Energy for Hydrogen Fuel
Cell Power Generation Project.
(December 11, 2025)**

NOTICE OF PUBLIC HEARING

Public Hearing on Proposed Preliminary Decision to Issue Authority to Construct Permit to Kern Energy for Hydrogen Fuel Cell Power Generation Project

The San Joaquin Valley Air Pollution Control District (District) invites you to attend a public hearing to receive oral comments regarding the proposed issuance of Authority to Construct for Kern Energy's hydrogen fuel cell power generation project.

The meeting will be at **5:30 pm on Monday, January 12, 2026** at the David Head Center located at 10300 San Diego St., Lamont, CA.

Documents for this public hearing and additional information will be made available at <https://www.valleyair.org/public-meetings-and-participation/workshops-hearings/>. The analysis of the regulatory basis for this proposed action, Project #S-1251187, is available for public inspection at http://www.valleyair.org/notices/public_notices_idx.htm and at any District office. If you are unable to review the documents online, a paper copy can be obtained by calling (661) 392-5607 or by e-mailing your request to dan.klevann@valleyair.org.

Spanish interpretation services will be available at this meeting.

Exhibit K.

**Notice of Preliminary Decision for
the Issuance of Authority to
Construct and the Proposed
Significant Modification of
Federally Mandated Operating
Permit (December 11, 2025)**

**NOTICE OF PRELIMINARY DECISION
FOR THE ISSUANCE OF AUTHORITY TO CONSTRUCT AND
THE PROPOSED SIGNIFICANT MODIFICATION OF FEDERALLY
MANDATED OPERATING PERMIT**

NOTICE IS HEREBY GIVEN that the San Joaquin Valley Air Pollution Control District solicits public comment on the proposed significant modification of Kern Energy at 7724 E Panama Lane Bakersfield, California. The project is to install a hydrogen power generation operation including fuels cells, hydrogen purification unit, hydrogenation and dehydrogenation process units.

The District's analysis of the legal and factual basis for this proposed action, project # S-1251187, is available for public inspection at https://www.valleyair.org/notices/public_notices_idx.html and at any District office. The emission increase associated with this project is: 483 lb-VOC/year. This will be the public's only opportunity to comment on the specific conditions of the modification. If requested, the District will hold a public hearing regarding issuance of this modification. For additional information, please contact the District at (661) 392-5500. Written comments on this project must be sent or postmarked by January 27, 2026 to publicnotices@valleyair.org or **BRIAN CLEMENTS, DIRECTOR OF PERMIT SERVICES, SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, 34946 FLYOVER COURT, BAKERSFIELD, CA 93308.**

Exhibit L.

**Letter to District Regarding
Supplemental Comments on Notice
of Preliminary Decision for the
Issuance of Authority to Construct
Project No. S-1251187 (January 27,
2026)**



January 27, 2026

Sent Via Email publicnotices@valleyair.org

Brian Clements
Director of Permit Services
San Joaquin Valley Air
Pollution Control District
34946 Flyover Court, Bakersfield, CA 93308

Re: Supplemental Comments On Notice Of Preliminary Decision For the Issuance Of Authority To Construct Project No. S-1251187

Dear Brian Clements:

Thank you for the opportunity to provide comments on the issuance of an Authority to Construct (“ATC”) permit for the proposed hydrogen project at Kern Energy, Project No. S-1251187 (the “Project”). We write to submit supplemental comments to the letter submitted by our organizations on December 1, 2025. Despite the hearing that took place on January 12, 2026, the concerns discussed in our December 1 letter remain unaddressed. We have three additional points that the San Joaquin Valley Air Pollution Control District (“District”) must consider in its decision regarding Kern Energy’s ATC permit. First, the Air District inappropriately relies on Kern County’s determination that the project is exempt under the California Environmental Quality Act (CEQA) and ignores its obligation to step in as lead agency in light of Kern County’s failure to conduct an environmental review. Second, while the District and Kern County promised the implementation of an emergency plan respond to potential hydrogen leaks and/or explosions, no concrete commitments were made. Third, there has been no clarification about whether the purported nine (9) new jobs created by the project would go to workers who live in Fuller Acres or Lamont.

I. Air District Is Required Under CEQA To Step In As Lead Agency To Conduct An Environmental Review



As we discussed in our December 1, 2025 letter, the Project is one with significant potential environmental impacts. As a responsible agency, the District has the authority to exercise its independent judgment and refrain from issuing an ATC permit or Permit to Operate, regardless of Kern County’s adoption of a Notice of Exemption for the Project’s Plot Plan Review.¹ The District is also required to step in as lead agency to ensure compliance with CEQA and complete an environmental review of the project.

A responsible agency is “a public agency, other than the lead agency, which has responsibility for carrying out or approving a project.”² Even where an entity acts as a responsible agency, it must still adhere to CEQA’s environmental review requirements, which includes an independent review of the adequacy of any existing environmental reviews and adopting feasible alternatives and mitigation measures.³ Additionally, if a responsible agency has “its own independent authority to enforce or administer an environmental law,” it can exercise that authority by drawing its own conclusions on whether and how to approve a project or otherwise carrying out its responsibilities under relevant environmental statutes – in this case the Clean Air Act.⁴

The Air District does not need to — and should not — show any deference to Kern County’s determination that the Project is exempt from CEQA and, in light of the evidence in front of it, must deny the ATC permit. CEQA requires the Air District to consider the lack of review and independently determine whether and how to approve the ATC permit. Given the potential for significant impacts on the environment and health from the Project (especially given Kern Energy’s ongoing and severe history of air quality violations), the District must reject the ATC

¹ Responsible agencies are bound to a lead agency’s decision *whether* to prepare an EIR or Negative Declaration (CEQA Guidelines, § 15096(a)), but the statute and Guidelines explicitly omit the decision of whether an exemption applies, which demonstrates that responsible agencies are not bound by that decision.

² Pub. Res. Code § 21069.

³ Pub. Resources Code, § 21002.1(d); CEQA Guidelines, § 15096(a), (g).

⁴ *Santa Clara Valley Water Dist. v. San Francisco Bay Reg'l Water Quality Control Bd.*, 59 Cal. App. 5th 199, 213 (2020) (finding that CEQA’s saving clause, Pub. Res. Code § 21174, “makes clear that CEQA does not prevent the Board from discharging its [statutory] responsibilities.”); see also *Central Delta Water Agency v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 245, 274.)



permit until an Environmental Impact Report (EIR) analyzing all feasible alternatives and mitigation measures has been completed.

Moreover, since Kern County has issued a Notice of Exemption and the statute of limitation on challenging that action has run, the District must step in as lead agency. The CEQA guidelines explicitly contemplate scenarios under which a responsible agency must take on the lead agency's responsibility to comply with CEQA.⁵ One such scenario is when a lead agency has not prepared environmental documents for the project and the statute of limitations has run to challenge the action by the appropriate lead agency.⁶ That is precisely the case here, where Kern County claimed a CEQA exemption and did not prepare environmental documents. The statute of limitation has run to challenge that Notice of Exemption. Therefore, the Air District must comply with the CEQA Guidelines and take on the lead agency role with respect to this Project.

II. Adequate Emergency Plan Is Missing

Residents who live near the refinery have repeatedly expressed concern regarding the adequacy of emergency planning in the case of an explosion or fire at Kern Energy. The Project magnifies this concern since concentrated hydrogen gas heightens the risk of explosions and fires. Given that Kern Energy has previously violated the California Accidental Release Prevention (CalARP) Program,⁷ intended to prevent accidental releases of extremely hazardous substances and to minimize the damage if releases do occur, residents are rightfully concerned about the addition of hydrogen operations to the facilities. An acceptable evaluation of the Project must include a review of an adequate emergency plan.

An adequate emergency plan must, among other things, include properly trained first responders, reliable access to large quantities of water, and a community notification and response plan. Local first responders must be properly trained to contain and extinguish fires when hydrogen gas is

⁵ CEQA Guidelines § 15052.

⁶ CEQA Guidelines § 15052(a)(1).

⁷ CalEPA, Kern Oil & Refining Inc. (Kern Energy) Update on Environmental Compliance (August 2024), https://calepa.ca.gov/wp-content/uploads/2024/09/Kern-Energy-Activity-Log-8-21-24-_Final.pdf.



present. Fire containment plans must account for limited access to large quantities of groundwater, since access to water is not guaranteed in the vicinity of Kern Energy because of depleted groundwater reservoirs. Additionally, residents must be thoroughly informed and provided with all resources necessary to ensure safe evacuation in case of emergency. Residents must have an opportunity to comment and provide further suggestions on the emergency plan.

III. Jobs Created Are Not Going To Local Workers

At the January 12 public hearing, residents asked the same question multiple times with no direct response—will the purported nine (9) jobs created by the Project go to residents of Fuller Acres and/or Lamont? Without a clear response to this question, residents and the public cannot fully evaluate any benefits that the Project may provide. Residents of Fuller Acres and Lamont have suffered the health and environmental costs associated with living next to Kern Energy for many decades, but they have not received benefits. Meanwhile, Kern Energy continues to profit and expand its operations. Residents' concerns regarding the direct and meaningful benefits they will receive from the Project are warranted and must be addressed.

* * * * *

Thank you for your consideration of these comments. We look forward to working with you to ensure that the Project at Kern Energy does not harm communities we work alongside.

Sincerely,

Vivyana Prado
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Leadership Counsel for Justice and Accountability

Natalia Ospina
Legal Director
Center on Race, Poverty, and the Environment



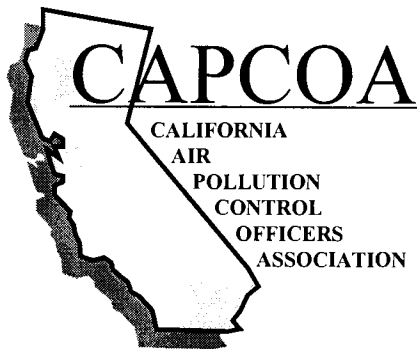
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Exhibit M.
California Implementation
Guidelines for Estimating Mass
Emissions of Fugitive Hydrocarbon
Leaks at Petroleum Facilities
(February 1999)

**CALIFORNIA
IMPLEMENTATION GUIDELINES FOR
ESTIMATING MASS EMISSIONS OF
FUGITIVE HYDROCARBON LEAKS
AT PETROLEUM FACILITIES**

February 1999



**CALIFORNIA
IMPLEMENTATION GUIDELINES FOR
ESTIMATING MASS EMISSIONS OF
FUGITIVE HYDROCARBON LEAKS
AT PETROLEUM FACILITIES**

Prepared by:

**The California Air Pollution Control Officers Association
Engineering Managers Committee
and
The California Air Resources Board Staff**

February 1999

ACKNOWLEDGMENTS

The following agencies participated in the development of these guidelines.

Bay Area Air Quality Management District
California Air Resources Board
San Joaquin Valley Unified Air Pollution Control District
San Luis Obispo Air Pollution Control District
Santa Barbara County Air Pollution Control District
South Coast Air Quality Management District
Ventura County Air Pollution Control District

AIR RESOURCES BOARD REVIEW

The staff of the California Air Resources Board has reviewed and approved the guidelines. Staff approval of the guidelines does not necessarily reflect approval of the guidelines by the Board.

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CALIFORNIA IMPLEMENTATION GUIDELINES FOR ESTIMATING MASS EMISSIONS OF FUGITIVE HYDROCARBON LEAKS AT PETROLEUM FACILITIES

I. PURPOSE:

The purpose of the guidelines is to facilitate the estimation of fugitive emissions from equipment components in the petroleum industry in the State of California. These guidelines contain some recommendations that all districts in California will apply consistently and some recommendations that each district may elect to use at its discretion.

II. BACKGROUND:

Beginning in 1993, the results of several studies conducted to improve the methodologies used for estimating fugitive hydrocarbon mass emissions from equipment components in the petroleum industry were published. The Western States Petroleum Association (WSPA) and the American Petroleum Institute (API) jointly commissioned the 1993 refinery equipment leak report to evaluate fugitive emissions collected from five petroleum refineries (the 1993 Refineries Study). API also commissioned the 1993 marketing terminal equipment leak report which included screening of four marketing terminals and the collection of screening and bagging data from three of the four marketing terminals (the 1993 Marketing Terminals Study). API, along with the Gas Research Institute, jointly commissioned the 1993 and 1995 oil and gas production reports, which included bagging and screening data from 24 facilities (the 1993/1995 Oil and Gas Production Study). In addition to these studies, screening data from 17 marketing terminals were also collected and compiled by API. The bagging and screening data from these industry-conducted studies are considered by the United States Environmental Protection Agency (U.S. EPA) to represent a significant improvement over data previously collected and analyzed.

Using information from the above studies and reports, the U.S. EPA developed new default zero factors, correlation equations, and pegged factors for estimating fugitive hydrocarbon emissions from equipment components in the petroleum industry as a whole. Also, the U.S. EPA developed new average emission factors and screening value range factors for the marketing terminal segment of the industry and new average emission factors and screening value range factors for the oil and gas production segment of the industry. These new factors and correlation equations are contained in the U.S. EPA Protocol, dated November 1995, entitled *1995 Protocol for Equipment Leak Emission Estimates* (EPA-453/R-95-017, "the 1995 EPA Protocol").

The 1995 EPA Protocol also presents procedures for estimating mass emissions from equipment leaks and describes the methodologies to be used. The methodologies include the following: four different methods for estimating total organic emissions from equipment leaks; EPA Reference Test Method 21 as the requirement for the use of a portable monitoring instrument; and, methodologies for bagging components and collecting data to generate unit-specific correlation equations.

In reviewing the 1995 EPA Protocol, the California Air Pollution Control Officers Association (CAPCOA), identified several technical corrections and adjustments that improve the accuracy of the 1995 EPA Protocol's factors and correlation equations. CAPCOA believes these corrections and adjustments significantly affect estimates of fugitive hydrocarbon emissions from California facilities.

CAPCOA's concerns have been expressed to the U.S. EPA. Since October 1996 representatives of CAPCOA, individual California air pollution control districts (districts) and the California Air Resources Board (CARB) have engaged in constructive dialogue with the U.S. EPA and the petroleum industry to address concerns expressed by CAPCOA. Documentation of this effort is contained in Appendix A. In general, CAPCOA expressed the following concerns:

1. Blowthrough Bagging Method Leaks - The bagged data for refineries and marketing terminals used in the development of correlation equations and factors were obtained using the blowthrough bagging method which did not account for hydrocarbon leaking into the bags.
2. Facility Grouping - Grouping data from all three facility types (refineries, marketing terminals, oil and gas production) to develop one set of pegged factors for the entire petroleum industry can significantly underestimates oil and gas production emissions.
3. Average Emission Factors - Average emission factors should represent the emissions from both controlled and uncontrolled facilities.
4. Component Identification and Counting - Existing component counts used by California districts may be inconsistent with the component count methodology used in the underlying studies.
5. ROC/THC Ratios - ROC/THC ratios of pegged factors produced by combining data from all segments of the petroleum industry may differ significantly from ROC/THC ratios currently being used by California districts.

6. *Dilution Probes* - The undemonstrated reliability of organic vapor analyzers (OVAs) equipped with dilution probes, in distinguishing one concentration range from another, casts uncertainty on pegged emission factors and correlation equations above 10,000 ppmv. OVAs were used to monitor fugitive hydrocarbon emissions during the underlying studies.

III. DISCUSSION AND CAPCOA RECOMMENDATIONS

Presented below are specific points of discussion and CAPCOA recommendations. Over the course of developing the guidelines, CAPCOA and industry have agreed that some issues can be addressed while other issues will need further evaluation. In addition to the discussion here, Appendix A contains a summary of agreements, key outstanding issues and proposed resolutions.

Blowthrough Bagging Method Leaks

CAPCOA has provided its analysis which demonstrated that adjustment to the correlation equations and pegged source factors are merited. This analysis was documented in the Santa Barbara County Air Pollution Control District report, dated May 1, 1997, entitled *Review of the 1995 EPA Protocol: The Correlation Equation Approach to Quantifying Fugitive Hydrocarbon Emissions at Petroleum Industry Facilities* (the SBCAPCD report). A revised copy of this report is contained in Appendix A.

As stated in the SBCAPCD report, a review of the bagging data sets from refineries and marketing terminals identified the need for several apparent technical corrections and adjustments. These include the following: adjustments to account for hydrocarbon leaks in bags collected with the blowthrough method; removal of one set of data from components that were double counted; removal of data from components that exceeded the 1995 EPA Protocol's 5% O₂ concentrations criterion; inclusion of data that had been inadvertently omitted; and, inclusion of data from liquid leaks in additional pegged source calculations. The corrections and adjustments resulted in changes to default zero factors, correlation equations, and pegged factors, ranging on the order of a few percent to about 50 percent. At this time, CAPCOA recommends that the default zero factors, correlation equations, and pegged factors be corrected to account for the documented technical corrections and adjustments.

Facility Grouping

CAPCOA maintains that upstream and downstream operations differ in the following ways: process streams (e.g., production heavy liquid such as crude oil versus refinery heavy liquid such as

diesel and kerosene); in process operations; and, in maintenance and/or maintenance frequency. These differences can produce differences in leak rates and leak frequencies among the various industry segments. At this time, this is an outstanding issue that is further discussed in Appendix A.

Average Emission Factors

The marketing terminal average emission factors were developed from screening data collected from facilities nationwide with varying degrees of inspection and maintenance (I&M) programs in place. Some of these facilities had agency mandated I&M programs while many may have had in-house preventive maintenance programs such as daily inspections and routine maintenance and services of major equipment. CAPCOA finds that the marketing terminal average emission factors represent averages of emissions from these facilities and that no control credit or deficit should be added to the factors.

The production of new refinery average emission factors was not one of the stated goals of the 1993 Refineries Study; therefore, no additional screening data were collected from refineries. This precluded the calculation of new average emission factors and screening value range factors for refineries. Refinery factors presented in the 1995 EPA Protocol are based on 1980 and 1982 refining fugitive emissions studies. In general, California refineries with existing I&M programs that routinely collect individual screening values are required to use either the Screening Value Range Method or the Correlation Equation Method (general or unit specific) instead of the Average Emission Factor Method.

At this time, the oil and gas production average emission factors are not included in the guidelines. This is an outstanding issue that is further discussed in Appendix A.

Component Identification and Counting

Components monitored in the development of the correlation equations and emission factors presented in the 1995 EPA Protocol were defined and counted using a specific methodology. That methodology may differ significantly from the procedures currently being used by some California districts. CAPCOA recommends that the component identification and counting methodology used in the underlying studies be used as the standard methodology throughout California. Section V of the guidelines provides the recommended component identification and counting methodology.

ROC/THC Ratios

Each of the three data sets (refineries, marketing terminals, oil and gas production) had unique ROC/THC ratios. Therefore, defining one general ROC/THC ratio based on combining

these data sets is not appropriate. For quantifying ROC emissions from THC data, district standard ratios or facility-specific ratios shall be used.

Dilution Probes

Compelling evidence indicates that screening data taken by OVAs fitted with dilutor kits are of undemonstrated reliability. Industry acknowledges that under certain conditions when using a dilution probe, resultant screening values can be in error. In addition, laboratory experiments conducted by CARB in September 1997 have shown that the dilution probe did not perform consistently (see CARB evaluation test report in Appendix C). However, the effect of using dilution probe measurements in the derivation of EPA's correlation equations and pegged emission factors has not been determined. At this time, this is an outstanding issue that is further discussed in Appendix A.

IV. METHODS OF CALCULATING FUGITIVE HYDROCARBON EMISSIONS FROM EQUIPMENT LEAKS:

The United States Environmental Protection Agency (U.S. EPA) Protocol, dated November 1995, entitled *1995 Protocol for Equipment Leak Emission Estimates* (EPA-453/R-95-017, “the 1995 EPA Protocol”) presents four different methods for estimating equipment leak emissions. The methods, in order of increasing refinement, are:

- Method 1: Average Emission Factor Method;
- Method 2: Screening Value Range Method;
- Method 3: Correlation Equation Method; and
- Method 4: The Unit-Specific Correlation Equation Method.

In general, a more refined method requires more data and provides more reliable fugitive hydrocarbon emission estimates. In the Average Emission Factor Method and the Screening Value Range Method, emission factors are combined with equipment counts to estimate emissions. To estimate emissions with the Correlation Equation Method, OVA-measured concentrations (screening values) for all equipment components are individually entered into correlation equations or counted as either default zeros or pegged components. In the Unit-Specific Correlation Equation Method, screening and actual mass emissions are measured as discussed in Section VII of the guidelines for a select set of individual equipment components at a site and then used to develop unit-specific correlation equations and pegged source factors. Screening values for all components are then entered into these unit-specific correlation equations and pegged source factors to estimate emissions.

Using CAPCOA recommendations, the U.S. EPA's four different methods can be applied and used to estimate fugitive emissions. Detailed discussion of the methods is presented in the 1995 EPA Protocol. Another source is the American Petroleum Institute (API) document, dated July 1997, entitled *Calculation Workbook for Oil and Gas Production Equipment Fugitive Emissions*, which provides step-by-step example calculations using each of the estimation methods outlined in the 1995 EPA Protocol. However, as discussed in Section III of the guidelines, some of the factors and correlation equations associated with the first three methods have been corrected and revised. Method 4 is not affected because it calls for the collection of site-specific data which are then used to develop unit-specific correlation equations and factors. Component counting, component screening, and the leak quantification must use the methods specified in Sections V, VI, and VII of the guidelines for the unit-specific equations and factors to be acceptable to the local districts.

Flow charts detailing the development of the 1995 EPA Protocol correlation equations and factors, the revisions made by CAPCOA, and the development of the oil and gas production correlation equations and factors are presented in Appendix B.

Presented below are CAPCOA's revised emission factors and correlation equations for calculating fugitive hydrocarbon emissions from the petroleum industry equipment components using the estimation methods outlined in the 1995 EPA Protocol. Also discussed is the potential application of the methods by California districts.

Method 1: Average Emission Factor Method

The average emission factors represent average facility emissions and no control credit or deficit will be assumed. The Average Emission Factor Method may be used by refineries and marketing terminals to estimate overall emissions only when reliable site-specific screening data are not available. In the case of new projects, once an I&M program is in place and reliable site-specific screening data are available, the source may use either the Screening Value Range Method (Method 2), the Correlation Equation Method (Method 3), or the Unit Specific Correlation Equation Method (Method 4) to estimate emissions and make the appropriate adjustment to the original estimates. A new facility may also use existing I&M data from similar processes to estimate emissions provided that the data are accepted by the local districts as being representative of the new source.

Table IV-1a contains the 1995 EPA Protocol average emission factors for refineries and Table IV-1b contains the 1995 EPA Protocol average emission factors for marketing terminals. [NOTE: The 1995 EPA Protocol factors presented in Table IV-1b have not been revised to reflect the technical corrections and adjustments discussed in Section III of the implementation guidelines.]

The successful use of Method 1 (Average Emission Factor) requires the completion of the following five steps:

- Step 1. Components are separated into component types (i.e., non-flange connectors, flanges, open-ended lines, pump seals, valves, others).
- Step 2. Each component type is further separated into service types (gas, light liquid, or heavy liquid) if there are different emission factors for the service types.
- Step 3. The total number of components in each group (component type/service type) is determined.
- Step 4. The number of components in each group is multiplied by the corresponding average emission factor to obtain the sub-total of emissions from the group.
- Step 5. The sub-totals of emissions from all groups are added to give total emissions from the facility.

Thus,

$$\text{Emissions}_{\text{comp A, service X}} = (\text{Component}_{\text{comp A, service X}} \text{ Count \#}) \times (\text{Average Emission Factor}_{\text{comp A, service X}})$$

Total emissions = Summation of emissions from all component/service types

EXAMPLE - AVERAGE EMISSION FACTOR METHOD

Five thousand (5,000) components at a marketing terminal were counted and placed in the eight groups of component type/service type that correspond to the 1995 EPA Protocol average emission factors for marketing terminals. The number in each group was multiplied by the appropriate average emission factor in Table IV-1b, and the total emissions estimate for the marketing terminal was found to be 0.0944 kg/hr.

TABLE ex-1: CALCULATION USING THE AVERAGE EMISSION FACTOR METHOD TO ESTIMATE EMISSIONS AT A MARKETING TERMINAL

Component Type	Service Type	Number of Components installed at the Marketing Terminal	1995 Protocol Average Emission Factor (kg/hr/source)	Subtotals (kg/hr)
Valves	Gas	28	1.3E-05	0.0004
	Light Liquid	593	4.3E-05	0.0255
Pump seals	Gas	0	6.5E-05	0.0000
	Light Liquid	25	5.4E-04	0.0135
Others	Gas	20	1.2E-04	0.0024
	Light Liquid	85	1.3E-04	0.0111
Fittings	Gas	224	4.2E-05	0.0094
	Light Liquid	4,025	8.0E-06	0.0322
TOTAL (kg/hr)		5,000		0.0944

TABLE IV-1a: 1995 EPA PROTOCOL REFINERY AVERAGE EMISSION FACTORS^a

Component Type	Service Type	Emission Factor (kg/hr/source) ^b
Valves	Gas	2.68E-02
	Light liquid	1.09E-02
	Heavy liquid	2.30E-04
Pump seals ^c	Light liquid	1.14E-01
	Heavy liquid	2.10E-02
Compressor seals	Gas	6.36E-01
Pressure relief valves	Gas	1.60E-01
Connectors	All	2.50E-04
Open-ended lines	All	2.30E-03
Sampling connections	All	1.50E-02

^aSource: 1995 EPA Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017, November 1995) which referenced the 1980 Petroleum Refining Study (EPA-600/2-80-075c, April 1980). These factors are based on the 1980 Petroleum Refining Study.

^bThese factors are for non-methane organic compound emission rates.

^cThe light liquid pump seals factor can be used to estimate the leak rate from agitator seals.

TABLE IV-1b: 1995 EPA PROTOCOL MARKETING TERMINAL
AVERAGE EMISSION FACTORS^a

Component Type	Service Type	THC Emission Factor (kg/hr/source) ^b
Valves	Gas	1.3E-05
	Light liquid	4.3E-05
Pump seals	Gas	6.5E-05
	Light liquid	5.4E-04
Others (compressors and others) ^c	Gas	1.2E-04
	Light liquid	1.3E-04
Fittings (connectors and flanges) ^d	Gas	4.2E-05
	Light liquid	8.0E-06

^aSource: *1995 EPA Protocol Equipment Leak Emission Estimates* (EPA-453/R-95-017, November 1995). NOTE: These factors have not been corrected to reflect the technical corrections and adjustments discussed in Section III of the implementation guidelines.

^bThese factors are for total organic compound emission rates (including non-VOC's such as methane and ethane).

^cThe "Others" component type should be applied for any component type other than fittings, pumps, or valves.

^d"Fittings" were not identified as flanges or non-flanged connectors; therefore, the fitting emissions were estimated by averaging the estimates from the connector and the flange correlation equations.

Method 2: Screening Value Range Method

The Screening Value Range Method was formerly known as the Leak/No Leak Method. This method uses the screening data (instrument screening values, “SV”) to calculate the mass emission rates based on the component leak level (below 10,000 ppm = no leak, or 10,000 ppm or greater = leak). Some districts define leaks at lower levels than 10,000 ppmv. A district may choose to apply the 10,000 ppmv emission factors to all components above their leak definition. Such a policy will generally result in a conservative estimation of emissions. Facilities that record individual screening values for each component may prefer to use the Correlation Equation Method (Method 3) or the Unit Specific Correlation Equation Method (Method 4).

Table IV-2a contains the 1995 EPA Protocol screening value range factors for refineries; Table IV-2b contains the 1995 EPA Protocol screening value range factors for marketing terminals; and, Table IV-2c contains the CAPCOA-revised screening value range factors for oil and gas production separated by stream types. [NOTE: The 1995 EPA Protocol factors presented in Table IV-2b have not been revised to reflect the technical corrections and adjustments discussed in Section III of the implementation guidelines.]

The successful use of Method 2 (Screening Value Range) requires the completion of the following five steps:

- Step 1. Components are separated into component types (i.e., non-flange connectors, flanges, open-ended lines, pump seals, valves, others).
- Step 2. Each component type is further separated into service types (gas, light liquid, or heavy liquid) if there are different emission factors for the service types.
- Step 3. The total number of components in each group (component type/service type) with screening values below 10,000 ppmv is determined. The total number of components in each group with screening values of 10,000 ppmv or more is determined.
- Step 4. The number of components in each sub-group (component type/service type/screening value range) is multiplied by the corresponding screening value range factor to obtain the sub-total of emissions from the sub-group.
- Step 5. The sub-totals of emissions from all sub-groups are added to give total emissions from the facility.

Thus,

$$\text{Emissions}_{\text{comp A, service X}} = (\text{Component}_{\text{comp A, service X}} \text{ Count \#})_{\text{sv} < 10,000 \text{ ppmv}} \times (<10,000 \text{ ppmv Factor}_{\text{comp A, service X}}) + (\text{Component}_{\text{comp A, service X}} \text{ Count \#})_{\text{sv} \geq 10,000 \text{ ppmv}} \times (\geq 10,000 \text{ ppmv Factor}_{\text{comp A, service X}})$$

Total emissions = Summation of emissions from all component/service types for both non-leakers and leakers

EXAMPLE - SCREENING VALUE RANGE METHOD

All components on three large heaters at a refinery were screened in accordance to Section VI of the implementation guidelines. The components were grouped by type, service (in this case all gas service), and screening value range. The number of components in each group was multiplied by the appropriate factor from Table IV-2a and the total emissions estimate for the heaters were found to be 2.56 kg/hr.

TABLE ex-2: CALCULATION USING THE SCREENING VALUE RANGE METHOD TO ESTIMATE EMISSIONS FROM THREE REFINERY HEATERS

Component Type/ (Service Type)	Screening Value Range (ppmv)	Number of Components Screened	1995 Protocol screening Value Range Factors (kg/hr/source)	Subtotals (kg/hr)
Valves (gas)	<10,000	164	6.0E-04	0.098
	≥10,000	7	2.626E-01	1.838
Pressure relief valves (gas)	<10,000	3	4.47E-02	0.134
	≥10,000	0	1.691	0.000
Connectors (gas)	<10,000	703	6.0E-05	0.042
	≥10,000	11	3.75E-02	0.413
Open-ended lines (gas)	<10,000	10	1.5E-03	0.015
	≥10,000	2	1.195E-02	0.024
TOTAL (kg/hr)		900		2.56

TABLE IV-2a: 1995 EPA PROTOCOL REFINERY
SCREENING VALUE RANGE EMISSION FACTORS^a

Component Type	Service Type	< 10,000 ppmv Emission Factor (kg/hr/source) ^b	≥ 10,000 ppmv Emission Factor (kg/hr/source) ^b
Valves	Gas	6.0E-04	2.626E-01
	Light liquid	1.7E-03	8.52E-02
	Heavy liquid	2.3E-04	2.3E-04
Pump seals ^c	Light liquid	1.20E-02	4.37E-01
	Heavy liquid	1.35E-02	3.885E-01
Compressor seals	Gas	8.94E-02	1.608
Pressure relief valves	Gas	4.47E-02	1.691
Connectors	All	6.0E-05	3.75E-02
Open-ended lines	All	1.5E-03	1.195E-02

^aSource: 1995 EPA Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017, November 1995) which referenced the 1982 Petroleum Refining Study (EPA-450/3-82-010, 1982). These factors are based on the 1980 and 1982 refining fugitive emissions studies.

^bThese factors are for non-methane organic compound emission rates.

^cThe light liquid pump seals factor can be used to estimate the leak rate from agitator seals.

TABLE IV-2b: 1995 EPA PROTOCOL MARKETING TERMINAL
SCREENING VALUE RANGE EMISSION FACTORS^a

Component Type	Service Type	< 10,000 ppmv THC Emission Factor (kg/hr/source) ^b	≥ 10,000 ppmv THC Emission Factor (kg/hr/source) ^b
Valves	Gas	1.3E-05	NA
	Light liquid	1.5E-05	2.3E-02
Pump seals	Light liquid	2.4E-04	7.7E-02
Others (compressors and others) ^c	Gas	1.2E-04	NA
	Light liquid	2.4E-05	3.4E-02
Fittings (connectors and flanges) ^d	Gas	5.9E-06	3.4E-02
	Light liquid	7.2E-06	6.5E-03

^aSource: 1995 EPA Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017, November 1995). NOTE: These factors have not been corrected to reflect the technical corrections and adjustments discussed in Section III of the implementation guidelines.

^bThese factors are for total organic compound emission rates (including non-VOC's such as methane and ethane). "NA" indicates that not enough data were available to develop the indicated emission factor.

^cThe "Others" component type should be applied for any component type other than fittings, pump seals, or valves.

^d"Fittings" were not identified as flanges or non-flanged connectors; therefore, the fitting emissions were estimated by averaging the estimates from the connector and the flange correlation equations.

TABLE IV-2c: CAPCOA OIL AND GAS PRODUCTION
SCREENING VALUE RANGE EMISSION FACTORS^a

Component Type	Service Type	< 10,000 ppmv THC Emission Factor (kg/hr/source) ^b	≥ 10,000 ppmv THC Emission Factor (kg/hr/source) ^b
Valves	Gas/Light Liquid	3.5E-05	1.386E-01
	Light Crude Oil	1.90E-05	7.07E-02
	Heavy Crude Oil	1.40E-05	N/A
Pump seals	Gas/Light Liquid	9.96E-04	8.9E-02
	Light Crude Oil	2.65E-04	8.9E-02
	Heavy Crude Oil	N/A	N/A
Others ^c	Gas/Light Liquid	1.47E-04	1.376E-01
	Light Crude Oil	1.31E-04	7.1E-03
	Heavy Crude Oil	5.7E-05	N/A
Connectors	Gas/Light Liquid	1.20E-05	2.59E-02
	Light Crude Oil	1.0E-05	2.34E-02
	Heavy Crude Oil	8.0E-06	N/A
Flanges	Gas/Light Liquid	2.80E-05	6.1E-02
	Light Crude Oil	2.4E-05	2.6E-01
	Heavy Crude Oil	2.3E-05	N/A
Open-ended lines	Gas/Light Liquid	2.4E-05	5.49E-02
	Light Crude Oil	1.8E-05	2.22E-02
	Heavy Crude Oil	1.5E-05	7.11E-02

^aSource: Fax Transmittal from STAR Environmental, dated December 17, 1997, entitled *Comparison of Screening Value Range Factors for Oil and Gas Production Operations*. These factors were developed using the separated oil and gas production default zero factors and pegged factors. Correlation equations for the petroleum industry (revised to reflect the technical corrections and adjustments discussed in Section III of the implementation guidelines) were used for components with screening values between background and 9,999 ppmv.

^bThese factors are for total organic compound emission rates (including non-VOC's such as methane and ethane) and apply to light crude, heavy crude, gas plant, gas production, and off shore facilities.

^cThe "Others" component type was derived from compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods stuffing boxes, relief valves, and vents. This "Others" component type should be applied for any component type other than connectors, flanges, open-ended lines, pumps, or valves.

Method 3: Correlation Equation Method

CAPCOA-revised 1995 EPA default zero factors, correlation equations, and pegged source factors for refineries and marketing terminals are presented in Table IV-3a.

As discussed in Section III (Blowthrough Bagging Method Leaks), technical corrections and adjustments were made to the data used in the 1995 EPA Protocol and revised correlation equations and emission factors were computed. The following guidelines are recommended for use with Table IV-3a: CAPCOA-revised 1995 EPA Correlation Equations and Factors for Refineries and Marketing Terminals.

- ▶ Default zero factors apply only when the screening value, corrected for background, equals 0.0 ppmv (i.e., the screening value is indistinguishable from the background reading).
- ▶ The correlation equations apply for actual screening values, corrected for background, between background and 9,999 ppmv and can be used for screening values up to 99,999 ppmv at the discretion of the local district.
- ▶ The 10,000 ppmv pegged factors apply for screening values, corrected for background, equal to or greater than 10,000 ppmv and are used when the correlation equations are used for screening values between background and 9,999 ppmv. The 100,000 ppmv pegged factors apply for screening values reported pegged at 100,000 ppmv and are used when the local district authorizes use of the correlation equations for screening values between background and 99,999 ppmv.
- ▶ Where multiple instrument screening values apply as with quarterly inspections, the average of the calculated mass emission estimates during the reporting period shall be used.

The successful use of Method 3 (Correlation Equation Method) requires the completion of the following six steps:

- Step 1. Record each individual component screening value.
- Step 2. Group the data by component type into three categories of screening ranges: default zeros range, correlation equations range, pegged source range.
- Step 3. Multiply the number of components with instrument screening values in the default zeros range by the appropriate default zero factors.
- Step 4. Enter each individual component screening value that is within in the correlation equations range into its appropriate correlation equation.

Step 5. Multiply the number of components with instrument screening values in the pegged range by the appropriate pegged factors.

Step 6. Add all calculated emissions to obtain the estimate of total emissions from the site.

Thus,

$$\text{Emissions}_{\text{comp A}} = \text{DZ}_A + \text{CE}_A + \text{PF}_A$$

Total emissions = Summation of emissions from all component types

Where,

$$\text{DZ}_A = (\text{Component}_A \text{ Count } \#)_{\text{SV in default zero range}} \times (\text{Default Zero Factor}_A)$$

$$\text{CE}_A = \text{Summation of } (\text{Correlation Equation}_A)_{\text{for each comp A SV in corr. eqns. range}}$$

$$\text{PF}_A = (\text{Component}_A \text{ Count } \#)_{\text{SV in pegged range}} \times (\text{Pegged Factor}_A)$$

EXAMPLE - CORRELATION EQUATION METHOD

Two hundred-sixty (260) components at a marketing terminal were screened in accordance to section VI of the implementation guidelines. The components were grouped by type and screening value (default zero, measurable screening value, pegged source). The number of default zeros and pegged sources of each type were multiplied by the appropriate factors from Table IV-3a. Correlation equations in Table IV-3a were used to calculate emissions from each component with a screening value that was above background but below 10,000 ppmv. Total emissions from the marketing terminal were calculated to be 0.2311 kg/hr.

TABLE ex-3: CALCULATION USING THE CORRELATION EQUATION METHOD TO ESTIMATE EMISSIONS FROM A MARKETING TERMINAL

Emissions From Default Zero Components

Component Type	Number of Default Zeros	CAPCOA Refineries and Marketing Terminals Factor (kg/hr)	Emissions (kg/hr)
Valve	46	7.8E-06	0.0004
Pump Seals	1	1.9E-05	0.0000
Others	7	4.0E-06	0.0000
Connectors	152	7.5E-06	0.0011
Flanges	38	3.1E-07	0.0000
Open Ends	2	2.0E-06	0.0000
Subtotal (kg/hr)			0.0015

Emissions From Pegged Source Components^a

Component Type	Number of Pegged Sources	CAPCOA Refineries and Marketing Terminals Factor (kg/hr)	Emissions (kg/hr)
Valve	1	0.064	0.0640
Pump Seals	0	0.089	0.0000
Others	0	0.082	0.0000
Connectors	2	0.030	0.0600
Flanges	1	0.095	0.0950
Open Ends	0	0.033	0.0000
Subtotal (kg/hr)			0.2190

^a pegged at 10,000 ppmv, less than 100,000 ppmv

EXAMPLE CONTINUED

Emissions From Components with Screening Values above Background but below 10,000 ppmv

Component Type	Screening Value (ppmv)	Correlation Equation (kg/hr)	Emissions (kg/hr)
Valve	300	$2.27E-06(SV)^{0.747}$	0.0002
Valve	5000	$2.27E-06(SV)^{0.747}$	0.0013
Valve	7000	$2.27E-06(SV)^{0.747}$	0.0017
Pump Seal	1200	$5.07E-05(SV)^{0.622}$	0.0042
Other	2000	$8.69E-06(SV)^{0.642}$	0.0011
Connector	75	$1.53E-06(SV)^{0.736}$	0.0000
Connector	800	$1.53E-06(SV)^{0.736}$	0.0002
Connector	3500	$1.53E-06(SV)^{0.736}$	0.0006
Connector	9000	$1.53E-06(SV)^{0.736}$	0.0012
Flange	50	$4.53E-06(SV)^{0.706}$	0.0001

Subtotal (kg/hr) 0.0106

TOTAL EMISSIONS FROM ALL COMPONENTS

Default Zero	Subtotal (kg/hr)	0.0015
Pegged Source	Subtotal (kg/hr)	0.2190
Correlation Equation	Subtotal (kg/hr)	0.0106
TOTAL (kg/hr)		0.2311

TABLE IV-3a: CAPCOA-REVISED 1995 EPA CORRELATION EQUATIONS AND FACTORS FOR REFINERIES AND MARKETING TERMINALS ^a

Component Type/ Service Type	Default Zero Factor (kg/hr) ^b	Correlation Equation (kg/hr) ^c	Pegged Factor (kg/hr) ^d	
			10,000 ppmv	100,000 ppmv
Valves/All	7.8E-06	$2.27E-06(SV)^{0.747}$	0.064	0.138
Pump seals/All	1.9E-05	$5.07E-05(SV)^{0.622}$	0.089	0.610 ^e
Others ^f /All	4.0E-06	$8.69E-06(SV)^{0.642}$	0.082	0.138
Connectors/All	7.5E-06	$1.53E-06(SV)^{0.736}$	0.030	0.034
Flanges/All	3.1E-07	$4.53E-06(SV)^{0.706}$	0.095	0.095
Open-ended lines/All	2.0E-06	$1.90E-06(SV)^{0.724}$	0.033	0.082

^aSource: SBCAPCD Report, dated May 1, 1997, entitled *Review of the 1995 Protocol: The Correlation Equation Approach To Quantifying Fugitive Hydrocarbon Emissions At Petroleum Industry Facilities*. Technical corrections and adjustments were made to the refineries and marketing terminals bagged data, obtained by use of the blowthrough method, to account for the hydrocarbon leak flow rate.

^bThe default zero factors apply only when the screening value (SV), corrected for background, equals 0.0 ppmv (i.e., the screening value is indistinguishable from background reading). The default zero factors were based on the combined 1993 refinery and marketing terminal data only; default zero data were not collected from oil and gas production facilities.

^cThe correlation equations apply for actual screening values, corrected for background, between background and 9,999 ppmv and can be used for screening values up to 99,999 ppmv at the discretion of the local district.

^dThe 10,000 ppmv pegged factors apply for screening values, corrected for background, equal to or greater than 10,000 ppmv and are used when the correlation equations are used for screening values between background and 9,999 ppmv. The 100,000 ppmv pegged factors apply for screening values reported pegged at 100,000 ppmv and are used when the local district authorizes use of the correlation equations for screening values between background and 99,999 ppmv.

^eOnly 3 data points were available for the pump seals 100,000 ppmv pegged factor.

^fThe “other” component type includes instruments, loading arms, pressure relief valves, vents, compressors, dump lever arms, diaphragms, drains, hatches, meters, and polished rods stuffing boxes. This “others” component type should be applied for any component type other than connectors, flanges, open-ended lines, pumps, or valves. However, if an acceptable emission estimate exists which more accurately predicts emissions from the source, then that emission estimate applies (e.g., positive flowing junction boxes in SCAQMD).

V. COMPONENT IDENTIFICATION AND COUNTING METHODOLOGY:

The collected data used to develop the EPA 1995 emission factors were defined and counted using a specific methodology. In order to accurately calculate fugitive emissions from leaking equipment using the new correlation equations and emission factors, it is essential that users identify and count components in the same way. This section defines and illustrates how components are to be counted for use with the new emission factors. This section also provides examples of components which are not included in component counts when using the Correlation Equation Method (general or unit-specific) for the quantification of fugitive emissions.

Component Identification and Counting Guidelines:

Connectors: Connectors are threaded connectors and tubing fittings of all sizes (see section on component identification and screening illustrations). Connectors generally have an outside diameter of 3 inches or less but may be larger. Each connection interface, regardless of size, counts as one component. Each threaded connection of processing lines to a valve is considered a connector and should be counted as a connector. However, the body connection and bonnet of a valve, and drain plugs threaded directly into the valve body are considered part of the valve and should not be counted separately. A piece of pipe with one end connected to a valve and the second end open to the atmosphere is considered an "open-ended line," not a connector.

Flanges: A flange is a projecting rim on a pipe or piping component used to attach it to another flanged piping detail or component (see section on component identification and screening illustrations). Flanges are bolted connections generally having an outside diameter greater than 3 inches but may be smaller. Each bolted connection of processing lines to a valve is considered a flange and should be counted as one component. Heat exchanger heads and bundle joints of the tube and shell type heat exchanger are considered flanges and should be counted. However, bolted body connections of a valve are considered part of the valve and should not be counted separately. A piece of pipe with one end connected to a valve and the second end open to the atmosphere is considered an "open-ended line", not a flange. Body flanges on meters and filters, and hatches on tanks and vessels are not counted as flanges. They are included in the "Other" category.

Open-Ended Lines (Also called "open-ended valves"): An open-ended line is the end of any valve that can be opened to the atmosphere (i.e., sample connections, drains, bleed valves) (see section on component identification and screening illustrations). If a short piece of pipe is attached to the end of a valve, but no pressure build-up can occur in the pipe, the system is considered an open-ended line and not a connector or flange. The open end of a pressure relief valve is part of the valve and is not counted as an open-ended line. When two valves are installed in series and both are closed (creating a double seal to prevent loss to atmosphere) the open end of the second valve is not counted as an "open-ended line". This system is counted as 2 valves. An outlet line sealed with a plug or cap is not considered an open-ended line. The plug or cap is a connector or flange.

Pump Seals: Pump seals are located at the interface of the pump shaft and housing and other joints of the pump (see section on component identification and screening illustrations). A pump is defined as a device that raises, transfers or compresses fluids by suction or pressure or both. Pumps are used to transport fluids by the addition of energy. All associated components such as connectors, flanges, and valves are counted in their respective categories. Pumps that are connected to vapor recovery systems or flare headers, are not counted.

Valves: Valve is a device that regulates or isolates the fluid flow in a pipe, tube, or conduit by means of an external actuator. Each valve is counted once regardless of the number of body flanges, bonnet flanges or plugs that are a part of the valve (see section on component identification and screening illustrations). Drain valves or vent valves attached to other valves are counted as separate valves. Only valves that have visible actuators are counted. Check valves and pressure relief valves (PRVs) are not counted as valves; they are included in the "Others" category. However, PRVs should be counted separately for refineries since there are average factors and screening value range factors for PRVs at refineries. Each connector or flange of a valve to a processing line is counted as a connector or flange and is not considered part of a valve.

Others: The "Other" component category includes: compressor seals, diaphragms, process drains, dump lever arms, access doors, hatches on tanks and vessels, instruments (i.e., pressure gauges, thermocouples if not sealed, sensing elements), meters, pressure relief valves (PRVs), polished rods stuffing boxes, sight glasses, truck loading arms, and degassing vents. Any component type which is not a connector, flange, open-ended line, pump seal, or valve is included in the "Other" category. However, compressor seals and PRVs should be counted separately for refineries since there are average factors and screening value range factors for compressor seals and PRVs at refineries. Additionally, if an acceptable emission estimate exists which more accurately predicts emissions from the source, that component type should also be counted separately. For example, in the SCAQMD, it has been found that junction box vents which exhibit positive flow cause a higher mass emission rate than that predicted by the 1995 EPA "other" category. The SCAQMD used the following correlation:

$$\begin{array}{l} \text{Emissions from} \\ \text{Positive Flowing} \\ \text{Junction Boxes} \end{array} = 1.428\text{E-}04(\text{SV})^{1.02} \text{ kg/hr}$$

"Inaccessible" Components: Inaccessible components is any component located over fifteen (15) feet above ground when access is required from the ground; or any component located over six (6) feet away from a platform when access is required from the platform. All inaccessible components are counted in the respective component categories.

Unsafe to Monitor Components: Unsafe to monitor components are components installed at locations that would prevent the safe inspection or repair of components as defined by Occupational Safety and Health Act (OSHA) standards or in provisions for worker safety found in 29 Code of Federal Regulations (CFR) 1910. All unsafe to monitor components are counted in the respective

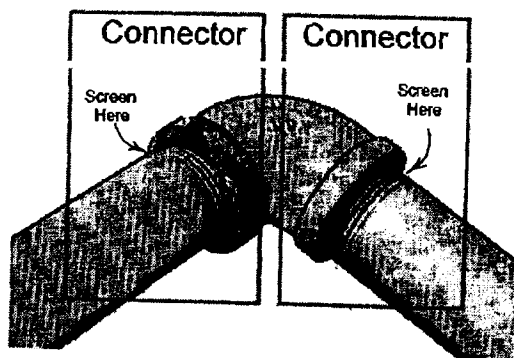
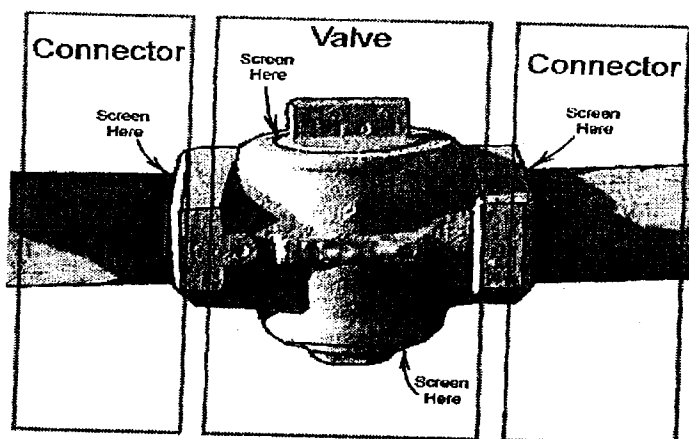
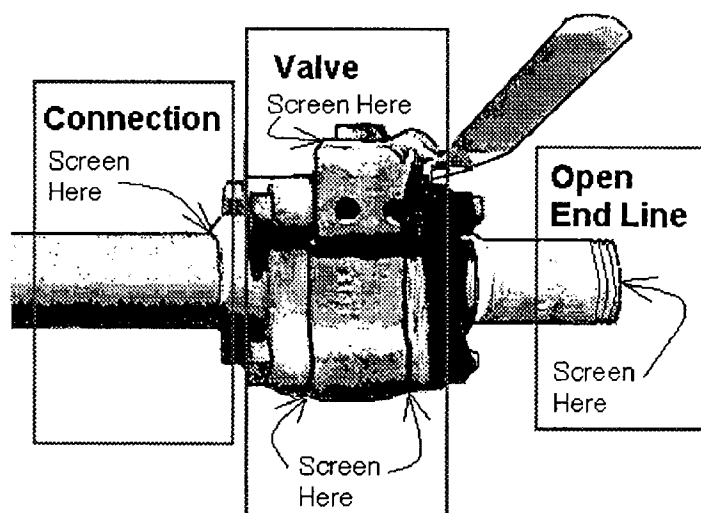
component categories and assigned a default zero reading unless it is shown to the contrary by the districts.

Components Not Counted:

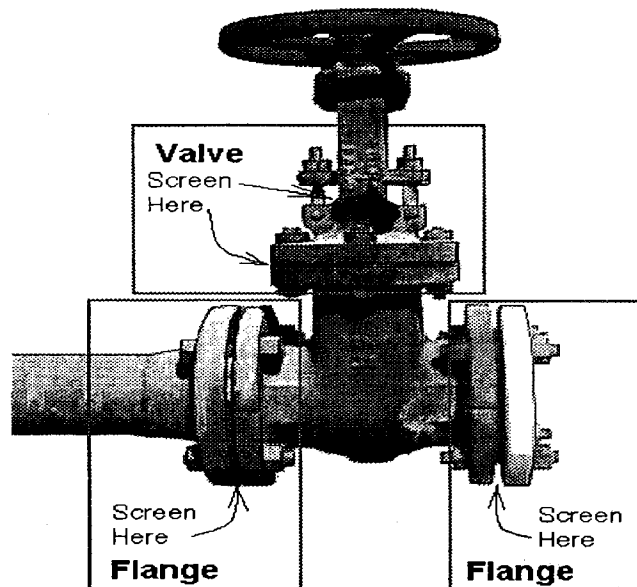
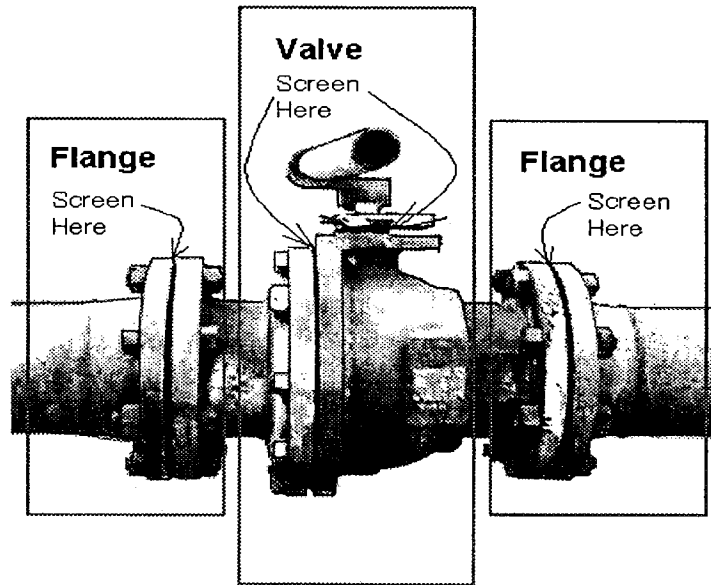
The following components are not included in component counts used for the quantification of fugitive emissions.

- ▶ components handling commercial natural gas
- ▶ components handling fluids of 10% by weight or less volatile organic compound
- ▶ components operating under negative pressure at all times
- ▶ components totally enclosed or contained such that there are no VOC emissions to the atmosphere.
- ▶ components handling non-volatile lubricating fluids
- ▶ components handling non-volatile hydrocarbon fluids used as heat transfer mediums, such as Therminol and glycol
- ▶ components buried below ground or under water
- ▶ components handling exclusively liquids which evaporate 10% or less at 150 °C
- ▶ components in water streams after primary separation at light crude oil production facilities
- ▶ components where a hydrogen sulfide (H₂S) exposure danger is present.
- ▶ components handling instrument air
- ▶ components on liquid drain lines downstream of the second block valve
- ▶ components on discharge lines of pressure relief devices that discharge to the atmosphere (however, the final discharge point will be considered as an open ended line)

Component Identification and Screening Illustrations:



COMPONENT ILLUSTRATIONS CONTINUED



VI. COMPONENT SCREENING PROCEDURES:

The component screening methodology including specifications and calibration requirements of the hydrocarbon monitoring instrument is detailed in EPA Reference Method 21 published in 40 CFR 60, Appendix A (EPA Method 21). Additional discussions of monitoring instruments, their performance, application, and maintenance are presented in the 1995 EPA Protocol. The 1995 EPA Protocol also discusses the procedures for screening equipment.

This section documents the component screening procedures and the specifications of the monitoring instrument used by the contractors during the underlying studies. This section contains additional criteria that may be more stringent than EPA Method 21 when used for estimating mass emissions. Included are pictorial diagrams illustrating screening points for several component types (see component identification and screening illustrations in Section V). This section also discusses certification of operators in the use of fugitive emissions monitoring equipment.

Monitoring Instrument Specifications:

The sensitivity of the monitoring instrument to measure leaks is mainly a function of the instrument flow rate, response time, probe diameter, and the calibration standards which the instrument is calibrated with. The portable hydrocarbon monitoring instrument used during the 1993 fugitive emission studies is the organic vapor analyzer (OVA) which utilizes the principle of hydrogen flame ionization for detection and measurement of organic vapors. Since only OVAs were used to measure leaks in those studies, it is unclear how the results would be affected had other detection instruments allowed by Method 21 been used. Therefore, the following additional criteria are recommended:

Instrument flow rate:

It has been shown that instrument flow rate has a great affect on screening value. This is caused by the effects of capture efficiency and mixing with background air during sampling as well as the response of the detector. For this reason it is imperative that instrument flow rates be maintained similar to those used in the development studies. Therefore, a flow rate specification of 0.7 - 1.2 liter per minute is suggested.

Response time:

Response time is a critical variable since the entire screening act in most applications takes less time than the Method 21 maximum allowable response time of 30 seconds to 90% of the maximum reading. It is believed that a 5 second response time to maximum reading is achievable with the OVA instrument and must also be achieved by any instrument used for estimating mass emissions in order to maintain equivalency.

Probe diameter:

Probe diameter may be influential since it is a limiting factor to how close the probe may get to the actual leak interface. The OVA instrument probe has an outside diameter of 3/16 inch.

Calibration standards:

The instruments in the development studies all used methane in air as the calibration standards. To maintain equivalency, the same calibration standards must also be used. This would also inherently eliminate the use of photoionization analyzers which generally show poor response to petroleum components.

In addition, compelling evidence indicates that screening data taken by OVAs fitted with dilutor kits are of undemonstrated reliability. Detailed discussion of this issue is presented in Attachment 3 of the SBCAPCD draft report, dated May 1, 1997, entitled *Review of the 1995 Protocol: The Correlation Equation Approach To Quantifying Fugitive Hydrocarbon Emissions At Petroleum Industry Facilities*. A copy of Attachment 3 is contained in Appendix E. The CARB is currently investigating this concern and an addendum to this document will be provided once the investigation is complete. In the interim the use of a dilution probe will be at the district's discretion.

Component Screening Guidelines:

It has been observed that during the development stage of the U.S. EPA correlation equations and emission factors, much care was taken during screening to identify the maximum screening value. During routine I&M inspections, however, screenings are performed more hastily. This is verified by the observation that discrepancies found in district's audits are located in harder to reach areas such as in higher locations. Additionally, maximum leaks often occur on the sides of the components facing away from access points or walkways. As a result, often times maximum leaks are not obtained or repaired during inspections. For this reason, the following guidelines are recommended.

The guidelines are based mainly on the screening methodology detailed in EPA Reference Method 21 published in 40 CFR 60, Appendix A (Method 21). However, in some cases, the guidelines may be more stringent than Method 21.

Basic screening instruction:

Place the probe inlet of the monitoring instrument at the surface of the component interface where leakage could occur such that the probe contacts the surface and minimizes the space between the interface and the probe. For equipment with moving parts, the probe should be placed no more than 1 centimeter from the surface. Move the probe along the interface periphery allowing a sufficient amount of time for the instrument to respond while observing the instrument readout. During this step the probe must not be moved at a rate of greater than one linear inch per instrument response time and the movement must encompass the entire interface. If there is an increase in the

meter reading, sweep back past the location at a slower movement rate and monitor the interface where leakage is indicated until the maximum meter reading is obtained. Leave the probe inlet at this maximum reading location for approximately two times the instrument response time. Record the highest reading. This procedure must also be repeated on all interfaces of a multiple interface component.

Background screening instruction:

Determine the local ambient concentration around the source by moving the probe inlet randomly upwind and downwind at a distance of one to two meters (three to seven feet) from the source. If an interference exists with this determination due to a nearby emission or leak, the local ambient concentration may be determined at distances closer to the source, but in no case shall the distance be less than 25 centimeters (about 10 inches).

Specific components screening instructions:

Flanges and Other Connectors - Monitor the entire circumference of the flange-gasket interface. Monitor the entire circumference of threaded connections, tubing fittings, and other types of non-permanent joints.

Open-Ended Lines or Valves - Place the probe inlet at the center of the opening to atmosphere.

Pump and Compressor Seals - Monitor pump seals at the point where the shaft exits the seal. If the source is a rotating shaft, position the probe inlet within 1 cm of the shaft-seal interface. If the housing configuration prevents a complete check of the shaft periphery, sample all accessible portions. Sample all other joints on the pump or compressor housing where leakage could occur.

Valves - Monitor all of the area where the stem comes out of the packing gland. Monitor any body flanges, bonnet flanges, or plugs on the valve.

Others - Monitor other components such as diaphragms, dump arms, instruments, meters, polished rods stuffing boxes, etc. at all points of possible emissions. Below are additional screening instructions for specific “others” components:

Access Door Seals and Hatches - Place the probe inlet at the surface of the door seal interface and monitor along the periphery.

Pressure Relief Devices Vented to Atmosphere - The configuration of most pressure relief devices prevents sampling at the sealing seat interface. For those devices equipped with an enclosed extension, or horn, place the probe inlet at approximately the center of the exhaust area to the atmosphere.

Process Drains, Manhole Covers, Junction Box Vents and Sewer Vents - If open, place the probe inlet at approximately the center of the area open to the atmosphere. If covered, place the probe at the surface of the cover interface and monitor along the periphery.

Seal System Degassing Vents and Accumulator Vents - Place the probe inlet at approximately the center of the opening to the atmosphere.

Operator Training and Certification:

To ensure that all operators are trained in the use of fugitive hydrocarbon monitoring instruments, including when the use of diluter kits is acceptable, CAPCOA recommends that a training program be established. Such training will improve the quality of data that are collected and reported to the districts. Cost of the program will be kept to a minimum. Training and/or certification will not replace district audits. This concept will be further evaluated and developed as a separate entity aside from the guidelines.

VII. LEAK QUANTIFICATION METHODS:

Leaks are quantified by mixing the fugitive hydrocarbon in a known quantity of air (or nitrogen) and determining the resulting hydrocarbon-to-air (or nitrogen) ratio. Three methods have been used by the U.S. EPA to quantify leaks: the vacuum method, the blowthrough method, and the high volume collection system (HVCS). The three methods share some common features.

The Vacuum Method

The vacuum method of quantification begins by sealing a bag of thin plastic or other impermeable material around a leaking component. A vacuum pump is used to draw air through the bag at a measured rate of up to 60 liters per minute. A sample of the gas from the pump outlet is analyzed for hydrocarbon content, either as parts-per-million by volume (ppmv) or total hydrocarbon, or as ppmv of methane, ethane, propane, etc.

The mass of the fugitive leak is calculated by multiplying the ppmv results by the total volume of air-hydrocarbon mixture flowing through the pump during sampling.

Section 4.2.1 of the 1995 EPA Protocol describes one of many configurations that can be used for the vacuum method. Different types of plastic or foil can be used to construct the bag, and various hydrocarbon analysis techniques can be used for analyzing the collected sample.

The Blowthrough Method

The blowthrough method is similar to the vacuum method except that compressed gas (such as nitrogen) is blown into the bag at a measured rate of up to 60 liters per minute and no pump is used at the outlet. A sample of the mixture inside of the bag is collected for analysis.

Section 4.2.2 of the 1995 EPA Protocol, which describes the method in detail, states that in addition to the compressed gas, ambient air sometimes enters the bag. For this reason, calculation of the hydrocarbon leak rate requires a correction for both air inflow and hydrocarbon

volumetric flow. The equation for calculating the leak rate is the following:

$$\frac{kg}{hr} = \left[\frac{GC \times MW_{cg}}{10^6 \times 22.413 \times \frac{(T+273)}{273}} \right] \times \left[\frac{N_2(l/min)}{1 - \left(\frac{O_2\%}{21} + \left(\frac{GC}{10^6} \times \frac{MW_{cg}}{MW_{hc}} \right) \right)} \times 0.06 \frac{m^3/hr}{l/min} \right] + \frac{\rho V_L}{16.67t}$$

Where:

- GC = Lab reported THC in units of ppmv
- MW_{cg} = Molecular weight of laboratory calibration gas
- 22.413 = Molar volume at 0 °C in m³/kg-mol
- T = Ambient temperature in Celsius
- MW_{hc} = Molecular weight of the leaking organic compound
The following default values for the term MW_{hc} have been accepted for use: for gas streams, MW_{hc} = 30 lb/lb-mol, for light liquid streams, MW_{hc} = 60 lb/lb-mol, for heavy liquid stream, MW_{hc} = 100 lb/lb-mol.
- ρ = Density of the organic liquid collected from dripping component (g/ml)
- V_L = Volume of liquid collected (ml)
- t = Time during which liquid was collected (in minutes)
- 16.67 = Conversion from g/min to kg/hr

The 1995 EPA Protocol suggests that the bag be constructed of plastic that is impermeable to the hydrocarbon being collected.

The High Volume Collection System (HVCS)

The High Volume collection System is similar to the vacuum method except that flow rates through the pump are as high as 500 liters per minute and the hydrocarbon-to-air ratio is measured directly at the pump outlet using the same monitoring instrument that was used for initial screening of the components. The fugitive leak rate is calculated by multiplying the volumetric flow through the pump by the ppmv of hydrocarbon. The method is described in detail in the U.S. EPA document, dated November 1995, entitled *Evaluation of the High Volume Collection System (HVCS) for Quantifying Fugitive Organic Vapor Leaks* (EPA-600/R-95-167).

VIII. DEFINITIONS:

API Gravity: The density of the liquid expressed in degrees and defined by the following equation:

$$\text{API Gravity} = (141.5 / \text{Sp. Gr.}) - 131.5,$$

where Sp. Gr. is the specific gravity of the liquid at 60°F.

Average Emission Factor: The average mass emission rate for the total population (including leakers and non-leakers) of a component type.

Bagging: Enclosing a leaking component in plastic film or a metal foil enclosure is referred to as bagging. Bagging is used to gather a sample of leaking hydrocarbon. Typically ambient air is drawn through the bag to catch the hydrocarbon (vacuum technique or High Volume Collection System) or nitrogen is blown into the bag to mix with the hydrocarbon (blowthrough technique). Either way, one or more samples of the hydrocarbon/carrier gas mixture is collected for laboratory analysis.

Blowthrough Bagging Method: A leak quantification technique that uses compressed gas (usually nitrogen) to sweep fugitive hydrocarbons through a plastic or metal foil bag fastened tightly around the leaking component. The hydrocarbon fraction in the nitrogen/hydrocarbon mixture is determined by gas chromatography or other laboratory techniques.

Calibration Gas: The U.S. EPA has specified that monitoring instruments are to be calibrated with mixtures of methane-in-air. A commonly used calibration gas for the high range of the monitoring instrument is 10,000 parts-per-million by volume, methane-in-air.

Connectors (See **Component**).

Component:

Connectors: Connectors are threaded connectors and tubing fittings of all sizes. Connectors generally have an outside diameter of 3 inches or less but may be larger. Each connection interface, regardless of size, counts as one component. Each threaded connection of processing lines to a valve is considered a connector and should be counted as a connector. However, the body connection and bonnet of a valve, and drain plugs threaded directly into the valve body are considered part of the valve and should not be counted separately. A piece of pipe with one end connected to a valve and the second end open to the atmosphere is considered an "open-ended line," not a connector.

Flanges: A flange is a projecting rim on a pipe or piping component used to attach it to another flanged piping detail or component. Flanges are bolted connections generally having an outside diameter greater than 3 inches but may be smaller. Each bolted connection of processing lines to a valve is considered a flange and should be counted as one component. However, bolted body connections of a valve are considered part of

the valve and should not be counted separately. A piece of pipe with one end connected to a valve and the second end open to atmosphere is considered an "open-ended line" not a flange. Body flanges on meters and filters, and hatches on tanks and vessels are not counted as flanges. They are included in the "Other" category.

Open-Ended Lines (Also called "open-ended valves"): An open-ended line is the end of any valve that can be opened to the atmosphere (i.e., sample connections, drains, bleed valves). If a short piece of pipe is attached to the end of a valve, but no pressure build-up can occur in the pipe, the system is considered an open-ended line and not a connector or flange. The open end of a pressure relief valve is not counted as an open-ended line. When two valves are installed in series and both are closed (creating a double seal to prevent loss to atmosphere) the open end of the second valve is not counted as an "open-ended line". This system is counted as 2 valves. An outlet line sealed with a plug or cap is not considered an open-ended line. The plug or cap is a connector or flange.

Pump Seals: Pump seals are located at the interface of the pump shaft and housing and other joints of the pump. A pump is defined as a device that raises, transfers or compresses fluids by suction or pressure or both. Pumps are used to transport fluids by the addition of energy. All associated component such as connectors, flanges, and valves are counted in their respective categories. Pumps that are connected to vapor recovery systems or flare headers are not counted.

Valves: Valve is a device that regulates or isolates the fluid flow in a pipe, tube, or conduit by means of an external actuator. Each valve is counted once regardless of the number of body flanges, bonnet flanges or plugs that are a part of the valve. Drain valves or vent valves attached to other valves are counted as separate valves. Only valves that have visible actuators are counted. Check valves and pressure relief valves (PRVs) are not counted as valves; they are included in the "Others" category. However, PRVs should be counted separately for refineries since there are average factors and screening value range factors for PRVs at refineries. Each connector or flange of a valve to a processing line is counted as a connector or flange and is not considered part of a valve.

Others: The "Other" component category includes: compressor seals, diaphragms, process drains, dump lever arms, access doors, hatches on tanks and vessels, instruments (i.e., pressure gauges, thermocouples if not sealed, sensing elements), meters, pressure relief valves, polished rods stuffing boxes, sight glasses, truck loading arms, and degassing vents. Any component type which is not a connector, flange, open-ended line, pump seal, or valve is included in the "Other" category. However, compressor seals and PRVs should be counted separately for refineries since there are average factors and screening value range factors for compressor seals and PRVs at refineries. Additionally, if an acceptable emission estimate exists which more

accurately predicts emissions from the source, that component type should also be counted separately. For example, in the SCAQMD, it has been found that junction box vents which exhibit positive flow cause a higher mass emission rate than that predicted by the 1995 EPA "other" category. The SCAQMD used the following correlation:

$$\begin{array}{l} \text{Emissions from} \\ \text{Positive Flowing} \\ \text{Junction Boxes} \end{array} = 1.428\text{E-}04(\text{SV})^{1.02} \text{ kg/hr}$$

Inaccessible Components: "Inaccessible" components is any component located over fifteen (15) feet above ground when access is required from the ground; or any component located over six (6) feet away from a platform when access is required from the platform. All inaccessible components are counted in the respective component categories.

Unsafe to Monitor Components: Unsafe to monitor components are components installed at locations that would prevent the safe inspection or repair of components as defined by Occupational Safety and Health Act (OSHA) standards or in provisions for worker safety found in 29 Code of Federal Regulations (CFR) 1910. All unsafe to monitor components are counted in the respective component categories and assigned a default zero reading unless it is shown to the contrary by the districts.

Correlation Equation: An equation that relates fugitive hydrocarbon mass emission rates in kilograms/hour, pounds/day, or pounds/year to instrument screening values in parts per million by volume. Correlation equations are used to calculate emissions from individual instrument screening values.

Default Zero: An average emission rate to be used for components that do not give instrument screening values higher than the background reading.

Emission Factor: The average mass fugitive emission rate for components in a specific screening value range. The factor is multiplied by the number of components to calculate fugitive emissions.

Flanges (See **Component**)

Fugitive Hydrocarbon Emissions: The term "fugitive" refers to unintentional emissions of hydrocarbon gases or liquid from valve stems, connections, shaft seals, etc. Occasional or continuous release of emissions through stacks or vents, whether intentional, accidental, or the results of a shut-down, start-up or emergency procedure are not considered fugitive emissions.

Gas (See **Service**)

Heavy Liquid/Heavy Oil (See **Service**)

High Volume Collection System: A leak quantification technique that uses a high flow of air to capture fugitive hydrocarbon leaks. The hydrocarbon fraction in the air/hydrocarbon mixture is determined using a portable hydrocarbon monitor.

Inaccessible Components (See Component)

Leak Frequency: The number of leaks per 100 components.

Light Liquid/Light Oil (See Service)

Marketing Terminal: A facility which handles the transfer or storage, or both, of petroleum products or crude petroleum in pipelines.

Monitoring Instrument: Portable monitoring instruments with internal pumps and hydrocarbon detectors. They are used to locate and/or quantify fugitive hydrocarbon emissions from equipment components.

Oil and Gas Production: A facility at which crude petroleum and natural gas production and handling are conducted, as defined in the Standard Industrial Classification Manual as Industry No. 1311, Crude Petroleum and Natural Gas.

Open-Ended Lines (See Component)

Other Component (See Component)

Organic Vapor Analyzer (OVA): A portable hydrocarbon monitoring instrument used during the 1993 fugitive emission studies which utilizes the principle of hydrogen flame ionization for detection and measurement of organic vapors.

Parts-per-million by Volume (PPMV): Most hydrocarbon monitoring instruments have displays that show the response of the instrument to known concentrations of methane-in-air measured in parts of methane per million parts of air by volume.

Pegged Source: An equipment component with fugitive hydrocarbon emissions that cause the monitoring instrument to exceed its maximum useful range. Because of this, no precise instrument screening value can be obtained for the component and it is referred to as a "pegged source".

Pump Seals (See Component)

Refinery: A facility that processes petroleum, as defined in the Standard Industrial Classification Manual as Industry No. 911, Petroleum Refining.

Screening: Monitoring an equipment component for fugitive hydrocarbon emissions usually through the use of a portable instrument.

Screening Instrument (See **Monitoring Instrument**)

Screening Value Range Emission Factor: The average mass emission rates for components with instrument screening values above an arbitrary leak definition (such as 10,000 ppmv) and below that definition.

Service:

Gas: Material in a gaseous state at operating conditions. Liquefied gases are considered light oil.

Light Liquid/Light Oil: Oil produced at production sites having an API Gravity of 20 or more. Bearing seal oils and hydrocarbon-based heat transfer fluids are also included in this category. Light hydrocarbons (such as propane and butane) that are in a liquid state inside of the components due to high pressure and/or low temperature are also included in this category. This category includes both pure liquid streams and streams that are mixtures of light liquids and gases.

Heavy Liquid/Heavy Oil: Oil produced at production sites having an API Gravity of less than 20. Pure liquid streams and streams containing mixtures of heavy oil and gases are included in this category.

Water/Light Oil: Water streams in light oil service with a water content greater than 50%, from the point of origin to the point where the water content reaches 99%. Components carrying water streams with a water content greater than 99% are not counted. Emission factors for water/light oil service should be used for components on oil-water separators, components on produced water tanks and components on piping and other equipment used for handling produced water prior to its injection underground.

THC and ROC: Total hydrocarbons (THC) include methane, ethane, propane, and any other organic molecule containing carbon. Reactive Organic Compounds (ROC) are defined differently by agencies but typically methane and sometimes ethane are not counted as ROCs.

Unsafe to Monitor Components (See **Component**)

Vacuum Bagging Method: A leak quantification technique that uses a vacuum pump to pull ambient air through a plastic bag fastened tightly around a leaking component. The hydrocarbon fraction in the resulting air/hydrocarbon mixture is determined by gas chromatography or other laboratory technique.

Valves (See **Component**)

Water/Light Oil (See **Service**)

REFERENCES

1. U.S. EPA, *Protocol for Equipment Leak Emission Estimates*, EPA-453/R-93-026, June 1993.
2. U.S. EPA, *Protocol for Equipment Leak Emission Estimates*, EPA-453/R-95-017, November 1995.
3. *1993 Study of Refinery Fugitive Emissions from Equipment Leaks, Volumes I, II, and III*, Radian DCN No. 93-209-081-02, Radian corporation, prepared for Western States Petroleum Association, Glendale, CA, and American Petroleum Institute, Washington, D.C., 1994.
4. *Development of Fugitive Emission Factors and Emission Profiles for Petroleum Marketing Terminals, Volumes I and II*, API 4588, Radian Corporation, prepared for American Petroleum Institute, 1993.
5. *Fugitive Hydrocarbon Emissions from Oil and Gas Production Operations*, API 4589, Star Environmental, Prepared for American Petroleum Institute, Washington, D.C., 1993.
6. *Emission Factors for Oil and Gas Production Operations*, API 4615, Star Environmental, Prepared for American Petroleum Institute, Washington, D.C., 1995.
7. Letter dated April 26, 1994 from Robert Strieter of American Petroleum Institute to David Markwordt of U.S. EPA, Re: The submittal of gasoline distribution facility fugitive equipment screening data.
8. *Calculation Workbook for Oil and Gas production Equipment Fugitive Emissions*, API 4638, STAR Environmental, Prepared for American Petroleum Institute, July 1997.
9. Memorandum dated February 27, 1997 from David Epperson of Eastern Research Group to David Markwordt of U.S. EPA, Re: Draft Analysis of Alternative Mass Emission Calculation Methods for the Blow-Through Bagging Method.
10. Santa Barbara County APCD, *Review Of The 1995 Protocol: The Correlation Equations Approach To Quantifying Fugitive Hydrocarbon Emissions At Petroleum Industry Facilities*, Draft Report, Santa Barbara, May 1, 1997.
11. Letter dated June 18, 1997 from Ronald D. Ricks of Radian to Frank E. Holmes of Western States Petroleum Association.

12. Fax Transmittal dated July 23, 1997 from Ray McCaffrey of Santa Barbara County APCD to Members of Correlation Equations Review Group, Re: SBCAPCD Comments on Radian's 6/18/97 Response to our 5/1/97 Draft Report.

Exhibit N.
Declaration of Christian Bisher

DECLARATION OF CHRISTIAN BISHER

I, Christian Bisher, declare as follows:

1. I have personal knowledge of the facts stated in this declaration and, if called as a witness, could and would testify competently thereto.

2. I am currently an Air Quality Specialist with the Central California Environmental Justice Network (“CCEJN”), where I work on air quality and environmental justice issues affecting communities in the San Joaquin Valley.

3. In my current role, I work extensively on matters relating to stationary source air permitting, enforcement of air permits and regulations, emissions calculations, air quality regulatory compliance, and local, state, and federal air quality rules and regulations.

4. Prior to joining CCEJN, I worked as an Air Quality Engineer for the San Joaquin Valley Air Pollution Control District (“District”). In that role, I evaluated and reviewed permit applications for industrial and commercial facilities, assessed emissions calculations and emissions factors, evaluated BACT (best available control technology) compliance, completed BACT Guideline recommendations, evaluated regulatory compliance, reviewed technical and engineering materials, and prepared technical analyses relating to air permitting requirements and air pollution control technologies.

5. Through my education, training, and professional experience, including my prior work as an Air Quality Engineer for the District, I have become familiar with the District’s permitting processes, emissions calculation methodologies, regulatory requirements, and technical analyses related to refinery and industrial operations.

6. I have reviewed materials relating to the Kern Energy refinery hydrogen project, including the San Joaquin Valley Air Pollution Control District’s (the “District”) October 28, 2025 Preliminary Decision Authority to Construct (ATC) Application Review and the District’s

1 April 30, 2026 Issued ATC Application Review for the “Refinery Hydrogen Power” project,
2 Project No. S-1251187, Permit No. S-37-178-0, together with the associated emissions
3 calculations, permitting analysis, and supporting technical materials.

4 7. By default, the District includes much less information in an individual application
5 than would be helpful. Therefore, I referenced District permit documents I had previously public
6 records requested, and I reviewed public records requested due to this hydrogen power ATC
7 project. There are still more public records that are being requested that would help in being able
8 to fully and properly review this project.

9 8. Based on my review of those materials, and based on my education, training, and
10 professional experience, including my prior experience as an Air Quality Engineer with the
11 District, it is my opinion that (1) the District’s VOC (volatile organic compounds) emissions
12 calculations are incorrect and even the incorrect Method 3 that was used contained significant
13 errors, omissions, unsupported assumptions, and methodological deficiencies that materially
14 affect the accuracy of the project’s emissions analysis and permitting review, (2) the District
15 incorrectly characterized the environmental significance of this project by providing Kern County
16 with incorrect VOC emissions (if normal CEQA practices at the District were followed), which
17 incorrectly allowed this project to be exempt from CEQA, (3) the District’s BACT analysis lacks
18 technologically feasible control technology that has been identified by the Bay Area Air District
19 and must therefore be evaluated in this project, (4) the District has failed to include other permit
20 units in this ATC project as the federal New Source Review (NSR) requirements for a project
21 “modification” have been met, (5) the District failed to comply with federal NSR “aggregation”
22 requirements by not including other projects that are technically or economically dependent with
23 the hydrogen power production project for federal threshold purposes, and (6) the District has
24 failed to show compliance with state required Community Emission Reduction Plan (CERP)

approved emission reductions.

(1) Incorrect VOC Emissions Calculations

9. Air permitting is highly regulated, with local, state, and federal requirements needing compliance - but needing compliance equally and fairly with all entities requiring air permits. This has resulted in emission factors (numbers representing the amount or concentration of air pollutants being emitted) and their calculation methodologies being standardized. This was accomplished by the US EPA in 1993 and updated in 1995 for equipment leaks (called fugitive emissions) in the petroleum industry with their document, *Protocol for Equipment Leak Emission Estimates*.

10. Regulators in the State of California evidently did not agree with this document, so in February 1999 the California Air Resources Board (CARB) and the California Air Pollution Control Officers Association (CAPCOA), in partnership with the Bay Area Air Quality Management District (AQMD), San Joaquin Valley Air Pollution Control District (APCD), San Luis Obispo APCD, Santa Barbara County APCD, South Coast AQMD, and Ventura County APCD produced their own document for calculating fugitive VOC emissions from petroleum equipment in the *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities*.

11. The District ensures compliance and equal conformity with rules and regulations through policies and internal process documents called FYIs or SOPs. The most important example of this for air permitting is APR-1010, ATC Application Review Format. This policy standardizes in very specific detail exactly how ATC application reviews are to be completed so that all applicable rules and regulations are complied with. More important for the calculation of VOCs in this project is Policy SSP-2015, Procedures for Quantifying Fugitive VOC Emissions At Petroleum and SOCMF Facilities. This policy states “Emission factors in the CAPCOA

document” (the Feb 1999 CAPCOA/CARB Guideline above, hereafter referred to as CAPCOA/CARB Guideline) “or emission factors in the EPA document” (the 1995 EPA protocol above) “shall be used for new or modified emissions units. However, the emission factors in the CAPCOA document will take precedent over emission factors in the EPA document.”

12. Additionally, in the application reviews for this project, the District stated the potential to emit (which is *the maximum capacity of an emissions unit to emit a pollutant under its physical and operational design*) for this project would be calculated using the CAPCOA/CARB Guidelines. Therefore, I believe it should be acknowledged that the CAPCOA/CARB Guideline is the authoritative way to calculate the fugitive VOC emissions in this ATC project.

13. As the authoritative document, the CAPCOA/CARB Guideline only allows four methods for calculating fugitive VOC emissions. The **ONLY** method allowed by the Guideline when no site-specific leak data (called screening values) is available is Method 1. To be clear, screening values in the CAPCOA/CARB Guidelines are the monitoring result of individually checking *an equipment component for fugitive hydrocarbon emissions usually through the use of a portable instrument*. The District uses Method 3; this method requires site-specific screening values - period. Method 3 does not allow screening values to be substituted with anything, including rule or BACT emission limits. Method 1 does allow for local air districts to use leak data (called existing I&M, Inspection and Monitoring, data) from similar processes to estimate emissions - but again, this has to be done with Method 1.

14. The CAPCOA/CARB Guideline Method 1 is designed and was created solely to get a facility permitted when no sight specific data exists using what all the organizations listed above believed were the best fugitive emission factors. Once a facility is operating and obtains site specific screening values, Methods 2-4 were created to estimate fugitive emissions based

1 upon how well a facility inspects and maintains their equipment. A facility that is very proactive
2 and spends money on frequent and thorough inspections and immediately fixes leaks will have
3 lower screening values and thus lower emissions when it comes time to estimate fugitive VOC
4 emissions. A facility that allows their equipment to degrade and only fixes leaks when they
5 become large and are obvious to audio and smell (sensory) inspections will have larger screening
6 values and thus higher fugitive VOC emissions. This design process and these methods of
7 calculating emissions is what was created by the group of organizations (which the District was
8 part of), and it is what District policy says will be used.

9 15. I 100% disagree that Method 3 of the CAPCOA/CARB Guidelines can be used for
10 this project, but for a moment, let's assume they are allowed. The District didn't even complete
11 Method 3 properly: (1) Method 3 requires individual component, site-specific screening values,
12 which do not exist for the new equipment in this project, (2) Method 3 correlation equation
13 components cannot be grouped together and must be calculated individually, (3) the pegged
14 factors from Method 3 were not used, and (4) in estimating the screening value, the District used
15 the regulatory limit, which does not limit a leak.

16 16. (1) As already stated, Step 1 of Method 3, the Correlation Equation, says
17 individual component screening values must be recorded. The proposed equipment consists of
18 new equipment that has not yet been installed or operated, and therefore, does not have the
19 component-specific screening values required for use of that methodology.

20 17. (2) Per Method 3, every single component that uses the correlation equation to
21 estimate emissions must be calculated individually (Step 4). The method does not allow
22 components to be grouped together as the District did when using the correlation equation. This
23 makes sense when you remember Method 3 is only supposed to be used when individual
24 component screening values are available for each component.

1 18. (3) The District did not use the pegged factors from the CAPCOA/CARB
2 Guideline. They instead used the correlation equation to estimate a leak at 9,999 ppm. The
3 definition and purpose of the pegged factors are to capture the amount of VOCs that leak when
4 leak monitoring equipment exceeds its maximum useful range. Both CCEJN's and CalGEM's
5 Method 21 gas analyzer has a maximum reading of 50,000 ppm as a reference. If Method 3
6 pegged factors are used as required, pegged daily and annual VOC emissions are 17.9
7 lb-VOC/day and 6,519 lb-VOC/year. The District's calculated VOC emissions are only 0.6
8 lb-VOC/day and 225 lb-VOC/year, which is only 3.46% of what they should be using.

9 19. (4) The District's estimated screening values are based upon the rule or BACT
10 allowed leaks. By making this assumption, the District is saying Kern Energy has NEVER had a
11 fugitive VOC leak from a component over the regulatory limit, which neither Kern Energy or the
12 District would say is true. In this very document, Kern Energy and the District say 0.5% of all
13 their components leak at a rate higher than their instruments read. In other ATC application
14 reviews that have been publicly noticed, Kern Energy and the District say pegged equipment
15 components are 0.15, 0.3, 0.7, and 1.0 percent. These are multiple sources of data that show Kern
16 Energy leaks exceed their equipment reading range, which is well above the rule and BACT
17 limits of 100 ppm and 500 ppm.

18 20. When Method 1 is used, fugitive VOC emissions are 399.9 lb-VOC/day and
19 145,955 lb-VOC/year. The District's incorrectly calculated VOC emissions are only 1.3
20 lb-VOC/day and 484 lb-VOC/year, which is only 3.46% of what the required Method 1 produces.
21 This is very important when you consider VOC emission increases at a major source in a
22 nonattainment area classified as extreme require emission reduction credits (ERCs) for emission
23 increases. There is an incentive for a pro-industry District to keep emission increases low so that
24 industry has to provide less ERCs in permitting. (This is an informed opinion made with 4 years

1 of work at the District with numerous examples showing this that can be shared with hearing
2 board members.) Also, higher levels of VOC emissions would impact a CEQA exemption based
3 on effects not being significant, and the health risk assessment results would show much higher
health risks.

4 21. It is therefore my opinion that the District's VOC emissions calculations should be
5 corrected and reevaluated using an appropriate emissions estimation methodology consistent with
the CAPCOA/CARB Guideline and applicable District permitting requirements.

6 (2) Environmental Significance of the Project

7 22. The CEQA lead agency determined this project was exempt from CEQA based on
8 incorrectly calculated VOC emissions. Once the VOC emissions are corrected as required by
Method 1, the District must send the updated information to the CEQA lead agency so that they
may properly evaluate CEQA for this project.

9 23. It seems unlikely the CEQA lead agency would determine an increase of 145,955
10 pounds of VOCs per year in an area classified as extreme nonattainment for multiple standards of
ozone is not significant.

11 (3) Incorrect BACT Analysis

12 24. The District incorrectly evaluated BACT for pumps and compressors at petroleum
13 refining facilities. A 2006 Bay Air District BACT Guideline for both pumps and compressors
at petroleum refineries list a limit of 100 ppm as technologically feasible, which means the
District needs to include a cost effective analysis for this more stringent technologically feasible
control technology.

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guideline**

Source Category

Source:	Pumps	Revision:	4
		Document #:	137.1
Class:	All	Date:	01/18/06

Determination

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice	TYPICAL TECHNOLOGY
POC	1. 100 ppm expressed as methane measured using EPA Reference Method 21 ^{a,T} 2. 500 ppm expressed as methane measured using EPA Reference Method 21 ^{a,T}	1. Double Mechanical Seals w/ Barrier Fluid; Magnetically Coupled Pumps; Canned Pumps; Magnetic Fluid Sealing Technology; or Gas Seal System Vented to Thermal Oxidizer or Other BAAQMD Approved Control Device; all w/BAAQMD Approved Quarterly Inspection and Maintenance Program ^{a,b,T} 2. Double Mechanical Seals w/ Barrier Fluid, and BAAQMD Approved Quarterly Inspection and Maintenance Program ^{a,b,T}

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guideline**

Source Category

Source:	Compressors	Revision:	4
		Document #:	48B.1
Class:	All	Date:	01/18/06

Determination

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice	TYPICAL TECHNOLOGY
POC	1. 100 ppm expressed as methane measured using EPA Reference Method 21 ^{a,T} 2. 500 ppm expressed as methane measured using EPA Reference Method 21 ^{a,T}	1. Double Mechanical Seals w/ Barrier Fluid; or Gas Seal System Vented to a Thermal Oxidizer or Other BAAQMD Approved Control Device; all w/ BAAQMD Approved Quarterly Inspection and Maintenance Program ^{a,b,T} 2. Double Mechanical Seals w/ Barrier Fluid, and BAAQMD Approved Quarterly Inspection and Maintenance Program ^{a,b,T}

25. It is likely the District will quote their BACT policies and state that application reviews use the approved BACT Guideline, and BACT Guidelines must be updated in a separate process. I would have originally agreed with them, but in making this very point to the District in a 2026 ATC permit comment letter, the District responded as below (response copied):

2. Role and Maintenance of the District BACT Clearinghouse

Comment Summary:

The commenter asserts that the District's BACT Clearinghouse is not adequately maintained, that existing metal coating BACT guidelines have been rescinded but could apply depending on how source categories are defined, and that the absence of an updated guideline calls into question application completeness and permit issuance.

District Response:

The BACT Clearinghouse is a streamlining and informational tool intended to document and organize BACT determinations for common classes and categories of sources. While the District's BACT policy expresses an intent to actively maintain the Clearinghouse, the existence or availability of a guideline is not a regulatory prerequisite to permit issuance. BACT is determined on a case-by-case basis pursuant to District policy and applicable law.

Many BACT guidelines referenced by the commenter have been rescinded because they no longer reflect current technology, regulatory requirements, or other technical assumptions used in BACT evaluations. Rescinded guidelines are not relied upon for permitting decisions and are not considered applicable BACT determinations.

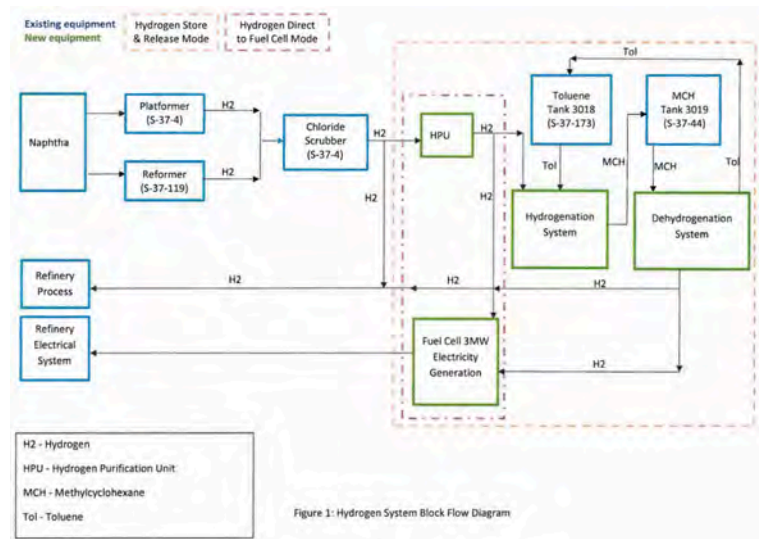
Where no active guideline applies, or where existing guidelines are outdated or rescinded, the District conducts a project-specific BACT determination using the same technical framework employed for guideline development. Completion or update of a BACT guideline is not required for an application to be deemed complete, nor is it required prior to permit issuance.

26. As can be read in this response, the District states their guidelines are not a regulatory prerequisite to permit issuance, and BACT is determined on a case-by-case basis. This

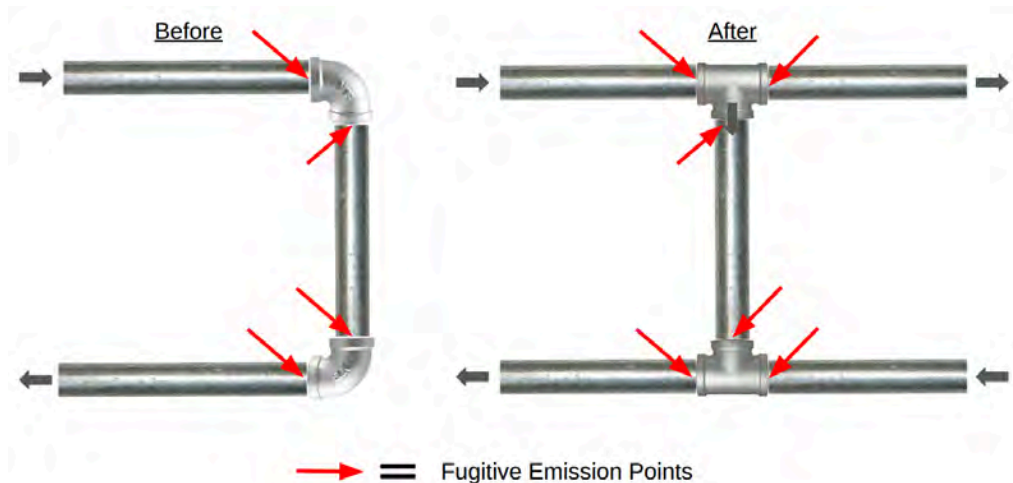
means that in this ATC application review, a major air district like Bay Area would have been reviewed to see if a more stringent achieved in practice or technologically feasible control technology existed. As shown here, a more stringent requirement has existed since 2006 and must therefore be evaluated in the BACT analysis for pumps and compressors.

(4) Additional Permit Modifications in this Application Review

27. The Application Review states that no changes are expected to the components of the Naphtha Reformer Unit (S-37-119) or the Platformer Unit (S-37-4). However, as can be seen in Appendix B, Process Flow Diagram, instead of process streams continuing to the existing refinery processes, the flow is going to be interrupted and sent to the new equipment being permitted in this ATC project. So there ARE changes to the existing permitted equipment.



28. More specifically, the fugitive emissions sources do change when adding the new equipment. Per the CAPCOA/CARB Guidelines, threaded connectors are considered one component for each threaded connection that can leak. The 90 degree elbow is considered two components, while a tee-connection is considered 3 components. Therefore, whatever permit unit this existing piping is connected to (whether the Platformer, S-37-4, or whatever permit unit is downstream) is being changed.



29. However, when it comes to air permitting, a change doesn't necessarily mean a permit is required. Rather, it must be determined if an existing permit unit is being "modified" according to rule definitions. District Rule 2201, Section 3.29.1.6 incorporates the federal definition of a modification, which is applicable to this project.

30. 40 CFR Part 51, Subpart I, Section 51.165(a)(1)(v)(A) lists the federal modification definition as "any physical change in or change in the method of operation of a major stationary source that would result in": significant emissions increases or significant net emission increases. While one might immediately think fugitive VOC emissions from leaks cannot be significant, following the regulation references gets to Section 51.165(a)(1)(x)(E) which says significant means *"any increase in actual emissions of volatile organic compounds from any emissions unit at a major stationary source of volatile organic compounds located in an extreme ozone nonattainment area that is subject to subpart 2, part D, title I of the Act shall be considered a significant net emissions increase."*

31. There is an increase in actual VOC emissions from a physical change - the pipes are being changed. Per federal definitions, a modification has occurred and either the Platformer (S-37-4) or the downstream permit unit must be included in this hydrogen energy ATC project. Also, the exact same scenario applies to permit units S-37-44 (the MCH tank) and S-37-173 (the

1 toluene tank), so those permit units should be included also. Lastly, for the toluene tank, the
2 higher health risk of toluene leaks must be evaluated instead of the 2020 lower risk from gasoline
3 or a general organic liquid, which would also require an ATC modification and inclusion into this
application review.

4 (5) Federal Major Source Project Aggregation

5 32. Project aggregation is the process of checking to see if individual ATC projects are
part of a larger federal major source project when comparing it with NSR significance thresholds.
6 *“Otherwise, a source could conceivably carve up a higher-emitting project into two or more
lower-emitting ‘projects’ and avoid triggering major NSR requirements. ‘Project aggregation,’
7 therefore, ensures that nominally-separate projects occurring at a source are treated as a single
project for NSR applicability purposes where it is unreasonable not to consider them a single
8 project.”* (EPA-HQ-OAR-2003-0064, II.B.)

9 33. In District Policy APR-1010, ATC Application Review Format, and District Policy
APR-1150, Major Modification Implementation, the District also states, “In general, new or
10 modified emission units that are technically or economically dependent shall be considered one
project for SB 288 Major Modification and Federal Major Modification applicability (see 71 FR
1 54235).” (The District’s reference, while the result is the same, is from 2006. Aggregation was
reevaluated in 2009, reconsidered in 2009/2010, and ultimately updated in 2018 in the referenced
1 I used above.)

1 34. In this hydrogen power ATC project, aggregation requires that the chloride
1 scrubber ATC project be evaluated with this ATC. The chloride scrubber application review says
2 it was installed “to remove chlorides from the hydrogen stream before it enters the fuel gas
system and other hydrogen required processes,” “the removal of chlorides from the gas will
1 decrease risk of corrosion to downstream equipment,” and “the chloride scrubber will be designed

1 to process the hydrogen gas downstream of the catalytic platformer and reformer.” This project
2 was submitted at roughly the same time as the hydrogen project was submitted to the county and
the District, and the refinery has operated for decades without it.

3 35. Aggregation also means the modification of the storage tanks and potentially vapor
control system that were modified when toluene and MCH were stored to facilitate the hydrogen
4 power process required chemical reactions also needs to be included in this larger federal major
5 source project. Separately (above), I have stated why the toluene and MCH tanks needed to have
an ATC project completed for them.

6 (6) CERP Emission Reduction Requirements

7 36. AB-617 Community Emission Reduction Plans (CERPs) and their requirements
are in state law under California Health and Safety Code Section (CH&SC) 44691.2, subdivision
8 (c). The District has not included a section in the ATC application review that evaluates their
9 compliance with CH&SC 44691.2(c).

1 37. The District has chosen to comply with numerous state air permitting requirements
by adding them to their ATC application review that are not required by federal clean air act and
0 new and modified source review as seen in District Policy APR 1010. Some of these state
requirements are (1) Rule 4102 and evaluation of CH&SC Section 41700 evaluate state nuisance
1 and injury prevention from air contaminants requirements, (2) CH&SC Section 42301.6
evaluation is used to comply with state school public noticing requirements when emissions
1 increase within 1,000 feet of a K-12 school, (3) the CEQA section incorporates the evaluation of
1 CEQA into the application review, and (4) state regulations such as CARB’s Airborne Toxic
2 Control Measures (ATCMs) and state methane regulations. The District could have chosen to
1 comply with these requirements any way they wanted, but they chose to include evaluation and
compliance in ATC application reviews because it made the most sense. (Some state regulations

1 may have eventually been connected to the Clean Air Act and new source review requirements
2 through State Implementation Plan (SIP) creditable emission reductions. However, these
3 regulations were initially adopted to reduce criteria pollutants and air toxics as stand alone
regulations themselves, and they were evaluated through the application review process.)

4 38. The District has many requirements in AB-617 CERPs. Based on the above
5 examples, it similarly makes perfect sense that these CERP requirements are evaluated within
6 ATC application reviews for AB-617 communities. The District did not do this in the preliminary
7 decision and issued ATC application reviews. In this ATC permit challenge, the hearing board
8 should verify the other ways in which the District is implementing all its AB-617 CERP
requirements. If the District cannot identify compliance with these requirements elsewhere, the
hearing board should require the District to include evaluation and compliance of AB-617 CERP
requirements in this ATC application review.

9 39. Specific items to be addressed include (1) required CERP VOC emission
10 reductions and (2) required CERP stationary source inspection frequency. As a previous Air
11 Quality permitting engineer, evaluating these requirements within an ATC application review
12 appears to be the most effective and efficient use of District resources. Regardless of the larger
13 decision on where to implement and comply with CERP requirements, the issued ATC does not
14 increase inspection frequency from other permitted units. Kern Energy has a documented history
15 of violations, including leaks. The ATC needs to be revised with more frequent inspections if the
16 CERP requirements are to be complied with.

1 I declare under penalty of perjury under the laws of the State of California that the
2 foregoing is true and correct.

3 Executed on May 29, 2026, at Fresno, California.


Christian Bisher

Exhibit O.
Letter to the District Regarding the
Arvin/Lamont Emissions Reduction
Program (June 6, 2022)



June 6th, 2022

Sent via email

Jessica Olsen & Ryan Hayashi
San Joaquin Valley Air Pollution Control District
34946 Flyover Ct,
Bakersfield, CA 93308

RE: Arvin/Lamont Emissions Reduction Program

San Joaquin Valley Air Pollution Control District Staff,

Leadership Counsel for Justice and Accountability works with residents of Fuller Acres and Lamont, two communities burdened by multiple sources of air pollution. Residents live and work in a sea of contaminants without respite. Participating in the AB 617 Community Air Protection Program is an opportunity for residents to identify sustainable long term solutions toward improving air quality and most importantly improving health outcomes.

The Community Air Protection Program is meant to drive community involvement in identifying community concerns and identifying community solutions. As such we write this letter to raise concerns regarding the AB 617 process in the Arvin/Lamont boundary and provide recommendations and edits to the community air reduction emission plan (CERP).

AB 617 Process

The Arvin/Lamont Community Steering Committee (CSC) is one of the largest committees in AB 617. We acknowledge the efforts provided by the San Joaquin Valley Air Pollution Control District (Air District) staff to ensure active participation of the CSC members. As a community driven process, adequate time to review documents and ask questions is critical for a meaningful community participation. Unfortunately, residents of the CSC were not provided adequate time to review the draft community air reduction plan (CERP). Most residents received the CERP in the mail on May 20th, with the expectation for a vote on May 25th. While the Air District provided a one week extension for a CERP vote, the additional time provided was not enough for residents to review the revised CERP before voting for the CERP on June 6th.

Community Emissions Reduction Plan

According to the Arvin/Lamont charter, the CSC is meant to, “Suggest and inform final strategies to be incorporated into the CAMP and/or CERP, including specific measures, enforcement strategies, and clear metrics to track progress.” Thus, the CERP must reflect recommendations provided by the CSC. We provide the following recommendations based on feedback provided by the community during the CSC meetings and conversations with residents.

Measure 4.A Enhanced Inspection Frequency

The Air District promises to increase inspections for emissions violations based on facilities who have violated emission permits in the last three years. We recommend that the Air District conduct inspection to facilities with violations within the last 5 years, to make sure more facilities are following permits. The CERP also states, “Compliance inspections are unannounced whenever possible,”. Residents have raised that announced inspections are not productive as facility staff are able to rectify violations prior to the inspections. The CSC also asks to be informed when facilities are in violation of emission standards.

Measure 4.B Stationary Source Rulemaking

The current CERP language states, “Community Steering Committee members, members of the AB 617-selected community, and the general public are encouraged to be involved in the upcoming rulemaking process for these rules.” AB 617 requires collaboration amongst the Air District and the community to develop more stringent rulemaking of stationary sources. As such, the Air District must commit to engaging the CSC in the development of more stringent rulemaking to ensure a regulatory reduction of emissions. The Air District can provide space during the CSC meetings to discuss the purpose of the stationary source rulemaking, and create space for residents to provide their feedback and inform more stringent rules. Engaging the CSC in these processes must transcend solely sharing meeting information. We recommend editing this measure to reflect strategies that the Air District will take to actively engage the CSC in the rulemaking. Furthermore, we urge the Air District to provide enforceable timelines for the review and adoption of these rules. Lastly, we urge the Air District to prioritize rules that can result in emissions reductions from the Kern Oil Refinery.

In addition to the edits on the measures stated above, we recommend including a measure to work with the Kern Oil Refinery to provide notification of emissions utilizing the fence line monitoring system. In addition to information and notification of emissions, the Kern Oil Refinery must commit to working with the CSC to reduce emissions based on community feedback.

Measure 5.A Reducing Exposure to Pesticides in the Community

The regulation of pesticides has been an immense concern for the community. The measure surrounding pesticides was debated deeply within the community. During the last CSC

Regular Meeting, members voted 18-18 in support of the pesticides measure, with the addition of buffer zones and notifications which were not added into the final CERP. Being that pesticides are a big issue for the community, below we have added a few additions to the CERP.

Work with the Kern County Agricultural Commissioner & the CSC to identify pesticide use & agricultural practices common to the community	● Identify pesticides used in Arvin/Lamont ● Communicate during each monthly meeting the to CSC the frequency, amount, and ingredients of pesticide use in community ● Communicate which harvests are associated with the pesticides that are discussed	DPR & Kern County Ag Commissioner
Assist in the identification of pesticides of concern by the CSC & provide technical expertise to aid the CSC in prioritizing pesticide monitoring	● Develop a screening approach for agricultural pesticides commonly used in community ● Support prioritization of pesticides for potential air monitoring based on screening criteria, including health impacts, proximity to sensitive land uses, application methods, and other relevant information	OEHHA
Engage with the CSC and the community on ongoing statewide pesticide notification development efforts	● Regular updates to CSC on the temporary pilot notification efforts ● Regular updates to CSC on timeline for notification in Kern county through statewide regulation ● Provide opportunities for public engagement & feedback on regulatory development ● Identify recommendations from the CSC to inform the Statewide Notification System	DPR
Engage with the CSC and the community on ongoing Sustainable Pest Management	● Regular updates to the CSC on the recommendations from the workgroup ● Provide opportunities for engagement in the workgroup and development of recommendations ● Provide education on the benefits of sustainable pest management	DPR

	• Work with the County Ag Commissioner to implement Sustainable Pest Management in the CSC Boundary by next year	
• Engage with the CSC and the Community on enforcement procedures including complaints	• Provide clear steps and processes on how to report illegal application of pesticides • Provide updates to the CSC on violation reports • Provide education of processes on how DPR handles illegal application of pesticides • Provide engagement opportunities the CSC to provide recommendations on how to improve current enforcement mechanisms • Implement recommendations provide by the CSC	DPR
Engage the School Districts in the 617 boundary to notify parent/guardians about restricted materials applications	• School districts must provide a yearly notice to parents/guardians about the restricted materials growers ¼ mile from the school intend to apply • Schools must provide notice of any changes to the list of pesticides used, as provided by the growers • Schools must provide information on the health impacts associated with pesticide exposure, specific to the pesticides that are used ¼ mile from the school	Kern High School District Lamont Elementary School Districts Arvin Union School Districts
Engage with the County Ag Commissioner and local groundwater sustainability agencies (GSA) to identify land to repurpose as buffer zones between ag and community, particularly, sensitive land uses	• Work with the Ag Commissioner to identify land for potential buffer zones • Prioritize land adjacent to sensitive land uses • Develop relationships with the local GSA to help identify land for buffer zones • Develop and execute plan for buffer zones near sensitive land uses	Kern Ag Commissioner Groundwater Sustainability Agencies

Agriculture - Dairy Digesters

The CERP identifies dairy digesters as a means of addressing air quality impacts from dairies. Dairy digesters do not effectively remedy the massive air quality impacts from dairy operations and in fact threaten to exacerbate and further entrench air and water pollution incentivizing and rewarding large dairy operations and manure management processes that pollute water with nitrates and air with vocs and ammonia, among other contaminants. Moreover, the incorporation of dairy digesters increases the risk of biogas facilities, consequently increasing emissions in the community. We request that digesters be removed from the list of strategies and be replaced by programs and policies that do in fact effectively reduce pollution from dairies.

Land Use

Multiple sources of pollution in the Arvin/Lamont CSC boundary is a result of historically locally unwanted land uses in the community. Zoning for industry near sensitive land uses increases the risk for additional industry to be built in the community, which will result in exacerbating air quality impacts. As such, we recommend a measure for collaboration amongst the Kern Planning Commission and the CSC to ensure notification of CEQA reviews, public hearings, and permit requests, for any industrial projects or transportation projects within the CSC. The Kern County Planning Commission, or County representative must provide an update about this projects in a timely manner or as the zoning ordinance requires.

Measure 5.D Address Potential Impacts From Idle Oil Wells in the Community

Residents have expressed concern about the lack of information available to the community regarding idle wells. This measure must have a commitment from CalGEM to the local community to identify the number of idle wells in the community, assess and monitor emissions from idle wells, and work with the CSC to develop a plan to address leaking wells. The current language in the measure does not show a strong commitment and it must be edited to reflect a strong commitment from CalGEM and a strong commitment from the Air District to ensure implementation of this measure.

The CERP does not mention the small communities within the 617 boundary, including Fuller Acres and Weedpatch. The CERP must mention these communities as part of the boundary and as eligible communities to benefit from the CERP.

The Community Air Protection Program is a trailblazing program as it shifts power to residents impacted by pollution to inform strategies to reduce emissions. As such, we urge the Air District staff to incorporate these recommendations in the CERP to reflect community priorities in the final adopted CERP. Thank you for your consideration.

Sincerely,

/s/

Sandra Plascencia
Policy Advocate
splascencia@leadershipcounsel.org

/s/

Emma De La Rosa, MPP
Regional Policy Manager
edelarosa@leadershipcounsel.org

cc:

Deldi Reyes, *Director*
Office of Community Air Protection
Air Resources Board

Michelle Byars, *Air Pollution Specialist*,
Office of Community Air Protection
Air Resources Board

Minh Pham, *Branch Chief*
Pesticide Programs Division
Department of Pesticide Regulation

Gustavo Aguirre Jr., *Co-Lead*
Central California Justice Network

Byanka Santoyo, *Co-Lead*
Center for Race Poverty and the Environment

Exhibit P.

Martin et. al, “A review of challenges with using the natural gas system for hydrogen” (April 24, 2024)

CHALLENGES TO INDUSTRY

A review of challenges with using the natural gas system for hydrogen

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Roland Kupers⁵ | David Cebon⁶ | Tom Baxter⁷ | Steven P. Hamburg²

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Abstract

Hydrogen, as an energy carrier, is attractive to many stakeholders based on the assumption that the extensive global network of natural gas infrastructure can be repurposed to transport hydrogen as part of a zero-carbon energy future. Therefore, utility companies and governments are rapidly advancing efforts to pilot blending low-carbon hydrogen into existing natural gas systems, many with the goal of eventually shifting to pure hydrogen. However, hydrogen has fundamentally different physical and chemical properties to natural gas, with major consequences for safety, energy supply, climate, and cost. We evaluate the suitability of using existing natural gas infrastructure for distribution of hydrogen. We summarize differences between hydrogen and natural gas, assess the latest science and engineering of each component of the natural gas value chain for hydrogen distribution, and discuss proposed solutions for building an effective hydrogen value chain. We find that every value chain component is challenged by reuse. Hydrogen blending can circumvent many challenges but offers only a small reduction in greenhouse gas emissions due to hydrogen's low volumetric energy density. Furthermore, a transition to pure hydrogen is not possible without significant retrofits and replacements. Even if technical and economic barriers are overcome, serious safety and environmental risks remain.

KEYWORDS

alternative fuels, decarbonization, energy, hydrogen, natural gas

1 | INTRODUCTION

Natural gas is an integral component of the world's current energy system, accounting for around a quarter of today's final energy demand globally.¹ Natural gas is principally comprised of methane (CH₄), with smaller amounts of mostly ethane and carbon dioxide (CO₂)—all

of fossil origin. Natural gas combustion is estimated to account for around 30% of annual global anthropogenic CO₂ emissions.² Furthermore, a growing body of research has revealed the extent of gas lost to the atmosphere throughout the supply chain, which is estimated to account for 12% of annual global anthropogenic methane emissions.³ Together, CO₂ and CH₄ are

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responsible for around 75% of today's gross warming relative to the beginning of the industrial revolution.⁴ Whereas experts suggest that we have the technologies available to cut CH₄ emissions from oil and gas operations by 75%,³ a transition away from fossil fuels and their combustion, including natural gas, is needed to achieve climate goals.⁵ Therefore, an obvious way to maintain beneficial use of the extensive and valuable global network of natural gas infrastructure during the impending energy transition would require switching to a gas/gas mixture that does not generate greenhouse gas (GHG) emissions when combusted.

Hydrogen (H₂) has emerged as a natural gas replacement, because it can release energy without associated carbon dioxide emissions. The chemical energy stored in the hydrogen to hydrogen bond can be converted to either heat through combustion or electricity in a fuel cell with no CO₂ emissions: processes that humans have been employing for more than 100 years.⁶ H₂ cannot currently be considered an energy source like natural gas, because it is being produced through methods such as electrolysis or steam reforming.⁷ There are numerous techniques available to manufacture hydrogen from feedstock molecules, including natural gas but also water. Currently, 99% of dedicated H₂ production relies on fossil fuels without carbon capture,³ emitting over 900 million metric tonnes of CO₂ into the atmosphere annually.³ There are more than a 1000 proposed projects aimed at scaling up zero- and low-carbon hydrogen production processes globally.⁸ There are challenges associated with each “clean” hydrogen production method as well—and no method is universally beneficial to the climate.^{9–12} For example, renewable energy displacement or high methane emissions can make hydrogen applications worse for the climate in the near-term than the fossil fuel systems they are replacing.¹³

Although reusing natural gas infrastructure for hydrogen is an appealing proposition, its feasibility rests on the suitability of the existing gas network for hydrogen gas. Decades ago, gas mixtures made by gasification of either coal or petroleum—known as “town gas”—contained high concentrations (up to 50% by volume) of H₂,¹⁴ and were piped into homes. Therefore, the distribution infrastructure could technically tolerate high levels of hydrogen. Although gas produced by gasification of petroleum naphtha and natural gas is still used in locations like Singapore and Hong Kong, this method has been abandoned in most of the world for safer options (natural gas), which do not contain toxic carbon monoxide. Therefore, most gas networks today are almost entirely designed for fossil gas mixtures that are primarily comprising methane (75% to 90%+ by volume, containing very little if any H₂). Material selection,

system attributes, storage systems, appliances and device design, and so on were designed, tested, and optimized specifically for the characteristics of natural gas and not for those of H₂. The fundamental differences in physical and chemical properties of H₂ and CH₄ are quite large, leading to challenges with respect to safety, energy supply, climate impacts, and cost.

In the following sections, we address the practicality, risks, and remaining data gaps of using H₂ in existing natural gas infrastructure by (1) contrasting physical and chemical properties between H₂ and CH₄; (2) describing how these differences affect each component of the existing natural gas system value chain; (3) discussing potential strategies to mitigate issues; and (4) the challenges associated with implementing such solutions.

2 | CONTRASTING PROPERTIES OF HYDROGEN AND NATURAL GAS

Although both colorless and odorless gases at standard temperature and pressure, H₂ and CH₄ are very different gases both physically and chemically (see Table 1). These differences present many challenges when considering the use of natural gas infrastructure for H₂, which are further discussed in Section 3. In addition, while CH₄ in the atmosphere absorbs radiation whereas H₂ does not, both can be oxidized leading to perturbations to atmospheric chemistry in ways that lead to increases in other GHGs.

2.1 | Physical

There are two key physical differences between H₂ and CH₄ that relate to their molecular sizes and liquid phase temperatures. First, hydrogen is the smallest and lightest element on the periodic table. A molecule of hydrogen—consisting of two hydrogen atoms—is therefore the smallest and lightest molecule. H₂'s weight and density is one-eighth that of CH₄ and its diffusivity in air is around three times higher (see Table 1). This means that H₂ can more rapidly leak from infrastructure, permeate through materials, and rise and accumulate at high points in enclosed spaces.¹⁵

Second, the temperatures at which H₂ and CH₄ can be converted into a liquid, which can be useful as a storage and transport mechanism, are −253°C and −162°C at atmospheric pressure, respectively. Thus, much more energy is needed to convert H₂ gas into a liquid and it is more likely to incur H₂ losses through evaporation given the high temperature difference between the liquid and the surrounding environment.

TABLE 1 Characteristics of hydrogen compared to natural gas (methane) and their implications.

Property		Hydrogen (H ₂)	Methane (CH ₄)	Hydrogen compared to natural gas (mostly CH ₄)	Implications of H ₂ compared to natural gas
Physical					
Size	Molecular weight, g/mol	2.106	16.04	~8× lighter	Permeates faster from gaskets, seals, plastic pipes, and other “soft” materials
Density	Density (NTP), kg/m ³	0.08375	0.668	~8× lower density	Rises and accumulates in enclosed spaces
Diffusion	Diffusion coefficient in air, m ² /s (20°C)	7.56E–05	2.21E–05	Higher diffusivity	Overall tendency to leak at a greater extent through intact materials of construction, seals, and piping joints
	Diffusion coefficient in water, m ² /s (20°C)	4.58E–09	1.62E–09		
Liquid phase	Temperature at atmospheric pressure (°C)	–253	–162	~100°C colder	Requires much more energy to convert to liquid state; more rapid boil-off
Chemical					
Chemistry	Reactivity	H-H bond symmetry	C-H bond asymmetry	Formation of partial bonds which lower activation energy	Accelerates fatigue cracking and reduces fracture toughness of steels
Ignition	Explosive limits, % - %, by volume	4–75	5.3–15	Higher explosive limit	May be depleted in underground storage
	Ignition energy mJ	20	290	Lower ignition energy	Higher fire risk
Flame	Maximum flame speed, m/s	0.34	2.9	~8× faster flame speed	Lower flame stability in burners, risk of flash-back
	Flame color	Invisible in daylight	Blue	Lower visibility	Harder to detect
Calorific value	Adiabatic flame temperature in air, °C	2210	1950	Higher temperature	More NO _x produced
	Higher heating value, MJ/m ³	12.7	39.8	1/3 of natural gas by volume	3× gas velocity needed to deliver the same amount of heat energy
					3× energy needed to compress gas
					3× volumetric gas flow measurements needed
					3× less line pack storage

2.2 | Chemical

There are four key chemical differences between H_2 and CH_4 that relate to their reactivity, flammability, flame properties, and energy density. First, H_2 is far more reactive than CH_4 . CH_4 is the least reactive of the hydrocarbons, and whereas H_2 's H-H bond has about the same bond energy as the C-H bond in CH_4 , H_2 's bond symmetry relative to CH_4 allows the formation of partial bonds which lower the activation energy of reactions with other molecules relative to methane.¹⁶ This means that H_2 can more easily react with some construction materials (e.g., cement) and it can be harder to store H_2 underground than CH_4 .

Second, the ignition properties of H_2 relative to CH_4 make it more flammable. Hydrogen has a much wider range between lower and upper flammability limits than natural gas (4%–75% for H_2 vs. 5.3%–15% for CH_4 and 5%–15.6% for natural gas).^{16,17} H_2 leakage is, therefore, more likely to reach a potential source of ignition within the range of ignitable mixture concentrations than similarly sized leaks of natural gas. H_2 also has a considerably lower ignition energy than CH_4 , meaning that it is considerably easier to ignite accidentally via arcs and sparks from electrical devices.¹⁷

Third, H_2 's flame properties make it more dangerous than CH_4 . H_2 's laminar flame speed is about eight times that of CH_4 .¹⁸ Flame speed affects flame stability in burners, the risk of flashback, and overpressure, which may be encountered during a deflagration event such as the ignition of gas leaked into a confined space. Flames of pure H_2 are also very low in visible light emissions, making flame detection more difficult. Finally, H_2 's adiabatic flame temperature is higher than that of CH_4 . This gives it the potential to generate more nitrogen oxides (NO_x) for given combustion conditions.^{17,19}

Fourth, H_2 has a very high energy density per unit mass, but per unit volume, its energy density is about one-third that of a typical pipeline gas. This means that much less energy is transmitted, distributed, and stored in the same volume of H_2 versus natural gas.

2.3 | Atmospheric

CH_4 is an infrared-absorbing GHG, whereas H_2 is not. However, both gases react with hydroxyl radicals in the atmosphere, leading to increased concentrations of other GHGs and, therefore, indirectly causing warming. For CH_4 , the main sink of emissions is atmospheric oxidation with the hydroxyl radical that on average takes about a decade, leading to the formation of the GHGs tropospheric ozone, stratospheric water vapor, and carbon

dioxide.²⁰ For H_2 , ~70% is taken up by microbial communities in the soil and the remaining ~30% take about 2 years to be oxidized by the hydroxyl radical, leading to the formation of tropospheric ozone and stratospheric water vapor.^{21,22} An additional warming effect from H_2 emitted to the atmosphere is that less hydroxyl is available to react with CH_4 , thereby increasing its residence time in the atmosphere. Consequently, current assessments of hydrogen's global warming potential suggest that H_2 can cause around ~12 times more warming than carbon dioxide (CO_2) over a 100-year period following emissions of equal mass, and ~37 times more warming over a 20-year period.²¹ CH_4 's warming potency (from direct and indirect warming effects) is around ~30 and ~80 times that of CO_2 over 100 and 20 years, respectively.⁴

3 | IMPLICATIONS ACROSS THE NATURAL GAS VALUE CHAIN

The physical and chemical differences between H_2 and CH_4 are critical to the suitability of using several components of existing natural gas infrastructure for H_2 , and contribute to safety, energy supply, climate, and cost risks (see Figure 1). Although there are solutions to mitigate some of these risks, they too are often associated with new risks and challenges.

3.1 | Production

Natural gas is produced from wells and fed via gathering lines to processing plants, where a gas mixture meeting pipeline specifications is produced. Purification processes vary by gas composition but often include removal in part or in total of gaseous higher-carbon hydrocarbons, butane, propane, ethane, in addition to sulfur compounds, mercury, carbon dioxide, water, and rarely, helium. Sometimes, nitrogen is added to reduce the energy content.

Some natural gas production can be expected in a decarbonized future, for use in producing chemicals like ethylene and propylene. However, given that most gas is burned rather than used as a chemical feedstock,²³ most natural gas wells, gathering lines, and processing plant infrastructure would only have very limited use in a decarbonized world as peaking capacity to complement renewable power and storage (see Figure 2). Reuse of some components may be possible, with scraps taken and repurposed. Therefore, new infrastructure would be required to scale up hydrogen production facilities and then transport the hydrogen to the natural gas

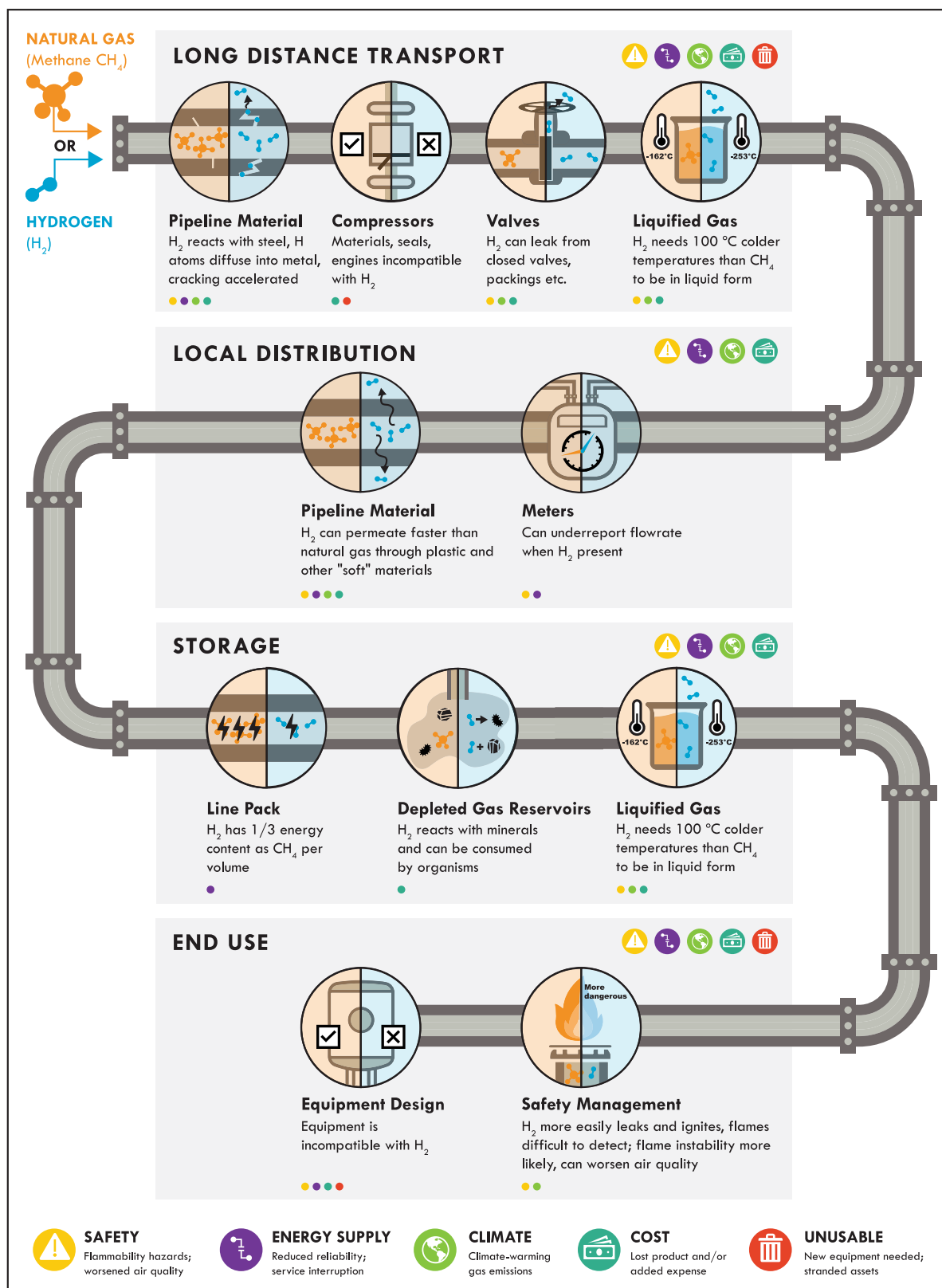


FIGURE 1 Challenges and risks with using existing natural gas system for pure hydrogen service.

COMPONENT		ISSUES	IMPACTS & RISKS	SOLUTIONS & CHALLENGES
PRODUCTION	Wells	Specifically for natural gas extraction	No re-use	None
	Gathering lines			
	Processing plants	Not designed for H ₂	Limited use in H ₂ processing	Partial salvage/relocation of assets
SAFETY Flammability hazards; worsened air quality ENERGY SUPPLY Reduced reliability; service interruption CLIMATE Climate-warming gas emissions COST Lost product; and/or added expense UNUSABLE New equipment needed; stranded assets				

FIGURE 2 Existing natural gas production system suitability for pure hydrogen.

transmission infrastructure. However, although natural gas processing plants are not designed for H₂, it is possible that some parts may be salvaged and relocated.

3.2 | Long-distance transport

Natural gas from processing plants is often transported long distances via transmission pipelines or transported in its liquified form, when crossing oceans. Transmission pipelines typically operate at considerable pressure (50–150 bar or 5–15 MPa); are constructed from high yield strength grades of carbon/low alloy steel; have exterior coatings and electrochemical protection to reduce pipe corrosion; and are often buried (or subsea) for physical protection.²⁴ Interior linings are sometimes used. The pipes are sized for pressure drops on the order of 5 psi per mile (20 kPa/km), with compressor stations at regular intervals to maintain pressure. These compressors often use centrifugal-type or reciprocating-type machines and are powered by gas turbines or engines fueled by the gas in the pipeline, and in some cases electric motor-driven.^{24,25}

There are several issues with using the current natural gas transmission system for H₂, relating to pipeline material, line capacity, valves, and compressors (see Figure 3).^{26–29} Hydrogen accelerated fatigue cracking (HAFC) is the primary concern in converting existing natural gas pipelines for H₂.^{30–32} In high-yield strength steels commonly used in gas transmission pipelines, exposure to molecular hydrogen combined with cyclic stress, initiated at manufacturing or welding flaws or corrosion points in the piping system, increases the growth rate of cracks. The process, known as HAFC, occurs because hydrogen atoms diffuse into the steel.³³ The cracks may ultimately extend through the wall of the pipe, causing it to leak or burst.³⁴ The hydrogen atoms

can also recombine into molecular hydrogen gas at defects in the steel.³⁵ Low-yield-strength steel pipes are not particularly susceptible to fatigue cracking unless both temperature and the partial pressure of hydrogen are quite high.^{30,36}

Recent, extensive testing of typical pipeline materials in Europe demonstrates both acceleration of fatigue cracking and reduction in fracture toughness when hydrogen is used, but the impacts vary widely depending on the material.³⁶ Welds and their heat-affected zones, as well as manufacturing or fabrication defects in the pipe increase vulnerability by serving as crack initiation sites.³⁷ This issue has been known for decades.

Pipe failure is of concern due to potential asphyxiation and fire and explosion.^{38–40} Because natural gas pipes are usually buried, external inspections are difficult and internal inspections are largely relied upon to verify the integrity of the pipe material. Consequently, there is a considerable risk of premature failure if natural gas pipes are re-purposed for H₂ service. There are, however, several solutions that have been suggested, but none are without additional challenges.

First, hydrogen could be “blended” with natural gas below a certain threshold so that the partial pressure of hydrogen is limited and HAFC risk is reduced.⁴¹ However, this significantly limits the decarbonization potential of using hydrogen, because it is not safe to pursue higher blending rates without undertaking retrofits or complete replacement of pipes. Even with small percentage admixtures of molecular hydrogen in high pressure natural gas pipes made of high-yield strength carbon steels it is expected that considerable acceleration of fatigue cracking, by as much as 30-fold, will occur with fracture resistance of the piping material reduced by as much as 50%.³⁴

Second, it is sometimes possible to install a liner or coating into a natural gas pipe to protect it against

LONG-DISTANCE TRANSPORT	COMPONENT	ISSUES	IMPACTS & RISKS	SOLUTIONS & CHALLENGES
	Pipeline material	H ₂ can dissociate into atomic H on steel surfaces from corrosion mechanisms, electroplating, or the decomposition of water from damp flux materials during welding	Reduced ductility, fracture toughness and fatigue resistance lead to accelerated cracking, causing leakage and potential mechanical failure	1. Limit amount of H₂ but limited decarbonization potential 2. Add liner/coating but more research needed; difficult to access/ inspect because most pipes underground; leakage; service interruption; expensive 3. Reduce operating pressure but reduces energy supply, line pack unless new pipe added in parallel 4. Replace pipe but service interruption; expensive
	Line capacity	H ₂ has 1/3 energy content as natural gas per volume; if design pressure de-rated, further reduction in energy content	At least 3x less energy delivered to consumers	1. Limit amount of H₂ but limited decarbonization potential 2. Increase volumetric flowrate by 3x but then compressors require 3x energy
	Compressors	Materials of construction, seals, engines, not designed for H ₂	Incompatible equipment	1. Limit amount of H₂ but limited decarbonization potential 2. Replace compressors but inconvenient, expensive
		Changes in operational pressure or flowrate to resolve other issues requires more energy	More input energy required to compress H ₂	1. More compressors but inconvenient, expensive 2. Shorter distances between compressors but inconvenient 3. More energy input but takes energy away from other uses
	Valves	Not designed for H ₂	H ₂ can leak from closed valves, packings etc.	Replacements required
	Liquefied gas	Requires extremely low temperatures	Energy intensive and leakage	Specialized infrastructure is required

 **SAFETY**
Flammability hazards; worsened air quality
  **ENERGY SUPPLY**
Reduced reliability; service interruption
  **CLIMATE**
Climate-warming gas emissions
  **COST**
Lost product; and/or added expense
  **UNUSABLE**
New equipment needed; stranded assets

FIGURE 3 Existing natural gas transmission system suitability for pure hydrogen.

corrosion and erosion, leading some to suggest that liners or coatings may provide a means to protect existing gas pipelines against HAFC associated with H₂.^{33,42,43} However, this can be challenging both technically and logistically. Furthermore, H₂ permeates through nonmetallic materials and, over time, even permeates through intact metallic materials.⁴⁴ Thus, the suite of hydrogen-impermeable materials to choose from is extremely limited. Moreover, installing a liner in an existing buried line is very difficult to undertake effectively and would require shutting down the pipe for an extended period of time.

Because permeation is likely inevitable, the space between the liner and the inner diameter of the pipe would need to be vented at numerous points along the pipeline, or else the cracking risk would not be prevented. The resulting H₂ leakage/venting also represents a flammability hazard and emits climate-warming H₂ into the atmosphere. Research into suitable options for the interior protection of gas pipelines against H₂-induced damage is underway, with recent developments identifying graphene and MXene as promising.⁴³ However, liners are difficult to install, control, and inspect regardless of material.

Third, cyclic stress amplitude can be reduced and HAFC might be delayed by operating piping systems at constant pressure, but practically it may not be possible, and other cyclic stresses (from vibration, soil movements, thermal expansion, and so on) will continue to pose a risk of fatigue cracking. Repurposing existing gas pipelines to carry H_2 would also often require de-rating the design pressure to as little as half to one-third of the original due to design codes and standards (see Supporting Information for details).⁴² A reduction in design pressure of this magnitude represents a very significant reduction in pipeline energy-carrying capacity and also diminishes the “line pack” (i.e., the energy stored in the form of gas compressed above its delivery pressure in the gas network; discussed further in Section 3.4).

There are safe materials available for construction of new, purpose-built H_2 pipelines.^{30,45} Purpose-built industrial hydrogen pipelines made from mild steels, lower strength steels or high yield strength steels that were designed and fabricated for use with hydrogen have been operating for decades.^{45,46} The key is design pressure determinations, materials selection, nondestructive examinations, welding methods, and testing all focused on H_2 applications. These pipelines are operated differently than natural gas pipelines, operating at low and near constant pressures (less than about 65 bar(g) or 6.5 MPa).

Regardless of potential modifications and replacement, an additional transmission challenge for hydrogen is pipeline capacity. With H_2 's energy density per unit volume at one-third that of a typical natural gas and the desirability of operating hydrogen pipelines at low pressure, the ability to move large amounts of hydrogen using existing pipelines is limited. For example, the amount of energy that can be transmitted by hydrogen compared to natural gas would be one ninth if derating pressure by on third and having one-third of the calorific value.

Alternatively, the volumetric flowrate could be increased so that a given gas transmission pipeline carrying hydrogen could deliver the same number of joules per hour of heat energy as existing natural gas pipelines.^{47–49} However, an increase in volumetric flowrate depends on compressors being able to overcome frictional losses, which would require a lot of energy.^{47–49} The mechanical energy to compress one gas relative to another is roughly inversely proportional to its molecular weight, which at constant temperature and pressure is proportional to the volumetric flow at a given compression ratio (see Supporting Information). Given that H_2 would need to flow in piping at roughly three times the volumetric flowrate of natural gas to deliver the same amount of energy, hydrogen compressors would require at least three times as much energy as those used for

natural gas. Compression energy requirements would be increased further if the design pressure of the piping must also be reduced; a line operating at reduced pressure would have reduced energy carrying capacity, and the pressure loss per unit length would require compression to a greater compression ratio at each compressor station. This would require proportionately more compressor input energy per delivered joule of heat energy in the transmitted gas, thus, undercutting the net climate benefits of delivered hydrogen. (See calculations in Supporting Information.)

Although the energy efficiency impact and cost may be significant, the need to replace all compressors in existing transmission systems with larger machines of considerably higher power and suction displacement would require a significant investment and the capacity to provide such compressors. Existing compressors are often made of materials of construction (high strength steels, and so on) and can have seals, and so on, incompatible with H_2 , and any engines previously running on gas would need replacement or significant modification to operate with pure H_2 .⁵⁰ In the absence of valve replacement hydrogen can leak from existing closed valves, packings, and so on, which leads to safety hazards, lost product, and climate-warming emissions.^{50,51}

3.3 | Local distribution

Once delivered to the “city gate,” natural gas is distributed to individual users via an extensive network of buried piping operating at medium to low pressures. These pipelines are made of a variety of materials ranging from mild steel to cast iron to high-density polyethylene (HDPE).

The lower pressure in the distribution network, the operation of piping farther away from their yield strength, and the infrequent use of high-yield strength steels in construction reduces the risk of HAFC. The major concerns in the gas distribution network for re-use with H_2 are not primarily associated with metallurgy, but rather with leakage and permeation and associated climate warming and fire/explosion risk (see Figure 4).^{26,28,29,52}

Hydrogen permeates through intact HDPE and other “soft goods” (polymeric and elastomeric materials used in gaskets, seals, and so on) at an appreciable rate.⁵³ The H_2 molecule's considerably smaller molecular diameter and high diffusivity relative to CH_4 lead to faster permeation, that is, more molecules of H_2 will permeate per unit time than molecules of CH_4 at a given pressure. There is also an overall tendency for H_2 to leak to a greater extent than that of natural gas.⁵³ Theory suggests that H_2 will leak at 1.3–3 times the rate of CH_4 .⁵⁴

	COMPONENT	ISSUES	IMPACTS & RISKS	SOLUTIONS & CHALLENGES
LOCAL DISTRIBUTION	Pipeline material	H ₂ can permeate faster than natural gas (depending on flow regime) through plastic and other "soft" materials that pipelines, gaskets, seals are often made of	This can lead to both small and bulk leaks due to reduction in tensile strength, and sometimes even material changes in pipes which can reduce its lifetime	1. Limit amount of H₂ and de-blend if needed at point of use but limited decarbonization potential and energy intensive 2. Liners to reduce permeability but more research required
	Gas meters	Some can underreport flowrate when H ₂ present and if flowrate increased there are technical challenges	Potential inaccurate measurements, incompatible design, hydrogen leakage	1. Limit amount of H₂ but limited decarbonization potential 2. Adjustments of gas metering and quality control systems but more research is needed 3. Replacement but costly
 SAFETY Flammability hazards; worsened air quality  ENERGY SUPPLY Reduced reliability; service interruption  CLIMATE Climate-warming gas emissions  COST Lost product; and/or added expense  UNUSABLE New equipment needed; stranded assets				

FIGURE 4 Existing natural gas distribution system suitability for pure hydrogen.

Measurements confirm the increased H₂ leakage rate through plastic piping of four to five times that of natural gas.^{24,55} However, there are some limited lab experiments that indicate that hydrogen may leak at the same rate⁵⁶ or faster than methane⁵⁷ depending on flow regimes.

There is also some evidence of material property changes in HDPE piping after exposure to hydrogen, and additional research is warranted to understand a safe lifetime for HDPE pipes used in the distribution of hydrogen. There doesn't appear to be any safety concern related to premature failure arising from hydrogen exposure.⁵⁵ However, elastomeric materials exposed to hydrogen show reduction in tensile strength due to permeation, increasing the risk of larger leaks.²⁴

The use of liners to reduce permeability may provide a partial solution, but more research is required.⁴² Alternatively, blending hydrogen into the gas network for transport is another option to mitigate issues of transporting hydrogen, although it provides limited decarbonization potential. Some have raised the potential of de-blending when pure H₂ is required. Methods including pressure- or temperature-swing adsorption and selective membranes have been examined in detail.^{24,55} The result would be a significant additional cost and energy demand per kilogram of pure hydrogen recovered.²⁴ Methane and hydrogen emissions associated with the separation process would also be of concern.

Gas meters in the distribution network would likely need significant retrofit or replacement.^{26,58} Not only might they be required to measure gas volumetric flows three times as high as those required for fossil gas (to deliver same energy content to consumers), but

diaphragm-type meters using large elastomeric or polymeric components have been known to under-report flowrate when fed gas mixtures containing hydrogen.⁵⁹

3.4 | Storage

Natural gas systems contain both large storage elements for management of seasonal variation in gas use and smaller storage elements that manage daily variations in flow. The storage afforded by virtue of the volume of gas held up in the transmission and gas distribution network itself is referred to as "line pack." Line pack storage, in the form of the difference in pressure between nominal and minimum operating pressure for the gas system in question, can represent many hours of system demand. Such storage, absent from electrical distribution systems, is a critical tool for maintaining gas grid operational stability against fluctuations in demand and supply and against interruptions in service due to equipment failures or maintenance.⁶⁰

Switching the gas system to pure H₂, with an energy density per unit volume roughly one-third that of a typical pipeline gas; therefore, would result in a reduction in "line pack" storage to one-third of the present value if storage pressure and volume are kept constant (Figure 5).⁴⁹ If pipeline design pressures must be de-rated to accommodate the added risks associated with hydrogen to the pipeline materials of construction (as discussed in Section 3.2), a further reduction in the line pack would be expected. This would either represent a reduction in reliability and peak flow handling capacity,

STORAGE	COMPONENT	ISSUES	IMPACTS & RISKS	SOLUTIONS & CHALLENGES
	Line pack	H ₂ has 1/3 energy content as natural gas per volume; if pressure de-rated, reduced more	At least 3x less energy stored	1. Limit amount of H ₂ but limited decarbonization potential 2. Augment with new storage
	Subsurface – Depleted natural gas reservoirs	H ₂ reacts with minerals and can be consumed by organisms	H ₂ amount depleted leading to lost product	Impractical; new options needed
			H ₂ purity compromised; incompatibility with fuel cells	Post-storage purification
	Subsurface – Salt caverns	Requires suitable geology	May not be available leading to limited storage options or distant locations	Build new pipes to caverns in suitable geology but leads to energy losses; emissions, costs
		New construction is intensive	Requires a lot of water and need to manage wastewater	Limit construction to seawater accessibility but restricts location
	Liquified gas	Requires extremely low temperatures	Energy intensive and leakage	Impractical; new options needed
SAFETY Flammability hazards; worsened air quality ENERGY SUPPLY Reduced reliability; service interruption CLIMATE Climate-warming gas emissions COST Lost product; and/or added expense UNUSABLE New equipment needed; stranded assets				

FIGURE 5 Existing natural gas storage system suitability for pure hydrogen.

or a need to install new dedicated storage not currently required on the network.

In most heating climates where gas use is much higher in winter than summer, additional gas storage is often incorporated into the gas network to provide a seasonal buffer. The volumes of gas involved are large, such that the use of above-ground storage facilities (such as the gas-o-meters previously used in the age of town gas) has largely been rendered impractical. Subsurface gas storage in depleted gas reservoirs, constructed salt caverns, and aquifers will be required to balance the system if there is variation in demand, yet H₂ is both geologically and biologically reactive.⁶¹ Storing H₂ in depleted reservoirs formerly containing natural gas is possible but will likely result in depleted product.^{55,62,63} Furthermore, uses such as fuel cells that require high purity hydrogen may be impaired if hydrogen has been contaminated due to storage in a former gas reservoir.⁶⁴

On the other hand, using salt caverns for hydrogen storage should not compromise the integrity of hydrogen as it should not react with salt, and salt caverns are used today for natural gas storage.^{65,66} However, suitable geology may not be available where storage capacity is required and not all salt domes are pure salt. Given the difficulties associated with using depleted natural gas reservoirs to store hydrogen, construction of “salt dome” storage facilities could represent a significant additional cost.¹⁴

3.5 | End use

Equipment (appliances, devices, and so on) designed to burn or derive energy from a gas mixture is optimized around the properties of that gas mixture. The tolerance for variations in gas properties, notably energy density per unit volume, flame speed, adiabatic flame temperature, explosive range, and the Wobbe index (an indicator of the interchangeability of fuel gases in combustion equipment) varies with the type of device. Most natural gas end-user devices can tolerate hydrogen additions to natural gas mixtures of up to about 20% by volume (about 7% in terms of energy content) without requiring significant modification.^{24,55,67–71}

However, very few appliances or end-user devices designed to use fossil gas mixtures are suitable for use with pure H₂ without significant modification or replacement.⁷²

Natural gas devices and appliances are incompatible with pure H₂ because of the physical and chemical differences between CH₄ and H₂ (Table 1). Hydrogen's smaller size allows it to escape more easily and permeate through materials, risking explosive-level concentrations and climate-warming emissions.¹⁵ Hydrogen's lower density also causes it to rise and accumulate at high points in enclosed spaces. Although the difference in buoyancy is somewhat offset by hydrogen's greater diffusivity, the greater diffusivity can lead to more rapid leakage.

H₂ is also more explosive, ignitable, burns hotter, and the flame is faster with lower visibility than CH₄; these characteristics yield higher safety risks. The significant differences in properties between typical natural gas mixtures and H₂, therefore, necessitate changes in the design of burners and burner management systems to achieve comparative levels of safety, which must then be certified (Figure 6).^{17,67} For example, all H₂ burner appliances require flame failure detection apparatus such as that used in the burners for ovens and broilers that shuts off the flow of gas when ignition does not result in a rise in gas temperature within a few seconds of the gas valve opening.

A quantitative risk assessment (QRA) was carried out in advance of a planned trial of pure H₂ in a residential gas distribution system in the UK.¹⁸ The report concluded that even if the homes were fitted with appliances designed and certified for use with H₂, the risk of damage and injury due to fires and explosions would increase in frequency and severity. The report recommended that in addition to a leak testing program, excess flow devices of dissimilar type be installed in every home operating with H₂ (something, i.e., not currently done for natural gas supplies). One such device would be a conventional excess flow valve, which closes when flow through the valve greatly exceeds the maximum expected flow (due to, for instance, damage to a downstream pipe). Another would be a “smart meter,” with an automated valve interlocked to close when the gas meter reported gas flow greater than the expected maximum. However, these devices were only expected to reduce the severity of fires and explosions, but not the frequency—therefore, the QRA asserted that injuries and deaths would be approximately the same as those encountered with existing gas use, even though events would be more frequent fires and explosions. The report also recommended that each room containing a gas appliance be fitted with a 10 × 10 cm nonclosing vent within 1.5 m of the ceiling, connected to the outdoors, to serve to vent any H₂ accumulating during a leakage event. Such vents would create a significant loss of heat and decreased comfort due to drafts, and therefore increased heating fuel use for the residents.

An additional safety challenge is the use of stenching agents, which are added to gas in the low-pressure distribution system to aid in leakage detection. Conventional sulfur-containing stenching agents, such as mercaptan used in the natural gas systems, are powerful fuel cell catalyst poisons.⁶⁴ However, they can be used as long as fuel cells are not deployed or are fitted with adsorbents to remove the stenching agent at the point of use, but this risks fuel cell failure.⁷³ Some previous research that has tested promising odorants compatible with fuel cells, but none appear commercially available.^{74,75}

Finally, although H₂ combustion would eliminate the toxic risk of carbon monoxide—a consequence of natural gas combustion—it would not eliminate NO_x emissions that all fuels generate when burned in air, by virtue of the reaction of atmospheric nitrogen with oxygen. The hotter hydrogen flame could yield more NO_x emissions than natural gas.^{71,72,76,77} Hydrogen combustion produces NO, which rapidly oxidizes to form NO₂, a pollutant regulated globally. NO₂ is a major health risk and is linked to childhood asthma among other ailments.⁷⁸ Residential and small commercial/industrial combustion equipment either vent into the room air (cooktops/hobs/ovens) or via a flue to the outdoors (boilers, furnaces), but without catalytic NO_x reduction equipment.^{79–81} For devices with an enclosed flue (furnaces, boilers, and so on), catalytic NO_x reduction is possible but is expensive and high-maintenance, because a reducing agent is required which must be replenished.

4 | DISCUSSION AND CONCLUSION

Replacing natural gas with zero- and low-carbon hydrogen is viewed by many as an attractive decarbonization tool, because it can potentially re-use expensive infrastructure of considerable economic value. However, this paper has shown that there are numerous unresolved challenges with using hydrogen in the existing natural gas infrastructure due to its differing physical and chemical qualities compared to methane, the main component of natural gas. These differences have major implications for the entire natural gas value chain—encompassing production, long-distance transport, local distribution, storage, to end use. The existing infrastructure is mostly unusable without de-rating to lower pressures (with consequently much decreased energy flow rates) or substantial investments, which often rely on unproven solutions. In addition, end-use appliances need replacement, and even then, they would still have safety and health challenges that would need to be overcome with new solutions.

Although many of the concerns associated with deploying pure hydrogen energy systems can be mitigated by blending hydrogen with natural gas, doing so will not help decarbonize the economy as it does not facilitate a gradual transition to pure hydrogen, and it only offers a small reduction in GHG emissions. The benefits from reduced GHG emissions are limited due to the greatly lower volumetric energy density of hydrogen relative to the gas it displaces. For example, a mixture of 20% hydrogen (by volume) into natural gas is only about 7% hydrogen in terms of energy content and, in the best case,

END USE	COMPONENT	ISSUES	IMPACTS & RISKS	SOLUTIONS & CHALLENGES
	Equipment design	Appliances, devices, and other equipment are optimized for a specific gas	Incompatible with pure hydrogen	1. Limit amount of H ₂ (most can tolerate up to 20% blends) but limited decarbonization potential 2. Replacement but costly
	Safety management	H ₂ is 8x lighter, more diffusive, and smaller than natural gas	H ₂ leaks are more likely	1. Leak testing program needed 2. Installation of several excess flow devices of dissimilar type but reduces fire severity not frequency 3. Each room with device fitted with non-closing vent connected to outdoors but loss of heat in winter
		H ₂ has wider explosive limit range than CH ₄ and lower ignition energy	H ₂ is easier to ignite	New burner management system required with flame failure detection interlocking but new device certifications required
		H ₂ flames are very low in visible light	Flame detection difficult (flame is not visible)	1. Additives to make flame visible 2. New burner management system required with flame failure detection apparatus but new device certifications required
		H ₂ 's laminar flame speed is 8x that of natural gas	Flame stability compromised, risk of flash-back, over-pressure possible	New burner management system required with flame failure detection apparatus but new device certifications required
		H ₂ adiabatic flame temperature is higher than natural gas	Reduced air quality from potentially more formation of harmful nitrogen oxides (NO _x)	1. Adjust air to fuel ratio upward but reduces device efficiency 2. Install NO _x reduction catalyst but impractical on most residential/commercial equipment
		Typical stenching agents not compatible with fuel cells	Sulfur-containing compounds are powerful fuel cell catalyst poisons	1. Fit fuel cells with adsorbent to remove stenching agent at point of use but risk of failure of fuel cells 2. More research into compatible stenching agents

SAFETY
Flammability hazards; worsened air quality
 ENERGY SUPPLY
Reduced reliability; service interruption
 CLIMATE
Climate-warming gas emissions
 COST
Lost product; and/or added expense
 UNUSABLE
New equipment needed; stranded assets

FIGURE 6 Existing natural gas end use system suitability for pure hydrogen.

represents only a 7% reduction in carbon dioxide emissions per joule of heat generated by its combustion. Furthermore, blending hydrogen with natural gas still has safety and climate risks from leakage and NO_x emissions.

Overall, while repurposing the natural gas system for use with hydrogen may, at first, seem appealing, the limited practicality, risks, and data gaps strongly suggest that like-for-like gas substitution provides limited

benefits for increased risks, even if major technical and economic hurdles are overcome.

That said, continuing to rely on natural gas is also not a viable option for addressing the climate crisis. Considering its physical and chemical properties, hydrogen is not an effective decarbonization tool for use in homes and buildings. For any decarbonization strategy, it is critical to determine if a fuel is in fact needed, and to compare with

potentially more effective options such as direct electrification using renewably generated electricity.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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