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January 27, 2021

Via electronic mail (gary.kupp@dcd.cccounty.us)[1]

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Department of Conservation and Development
30 Muir Rd
Martinez, CA 94553

Re: Phillips 66 Rodeo Renewed Project – comments concerning scoping: File LP20–2040

Dear Mr. Kupp:

Biofuelwatch, Community Energy reSource, Natural Resources Defense Council, Rodeo Citizens Association, San Francisco Baykeeper, Sierra Club, Sunflower Alliance, and 350 Contra Costa (collectively, Commenters) appreciate this opportunity to submit comments concerning the scope and content of Contra Costa County's Environmental Impact Report (EIR) for the proposed "Rodeo Renewed" project (Project) at the Phillips 66 Rodeo refinery described in the December 21, 2020 Notice of Preparation (NOP) and the August 2020 application for the Project (Application).

We welcome the County's decision to prepare an EIR for this highly significant project. However, for the reasons explained in these Comments, it will be imperative that the County probe deeply into all relevant aspects of the Project in preparing the EIR, beyond the very minimal information presented thus far by the Project proponent. The Application is long on general claims of Project sustainability, but remarkably short on information pertinent to actually quantifying and mitigating its impact – including, most notably, information necessary to determine an appropriate project baseline, the emissions and land use impacts of potential feedstocks, the increased transportation impacts including spill risks posed by increased throughput at the P66 marine terminal, and risks associated with increased hydrogen usage, the

[1] Most sources referenced in these Comments are being sent today via overnight mail on a thumb drive to the County. Exceptions are documents and information either known to be in the County's records (including the Application, the NOP, and documents provided by the County in response to Public Records Act requests from Commenters); and the documents referenced in note 79, which are a compilation of reports accessible through the cited link. Commenters can extract the data and send it in electronic form upon request, but will otherwise it assume that is not necessary.

impact of present and likely future equipment decommissioning. It will be imperative for the County, in preparing the EIR, to obtain, disclose, and thoroughly analyze all such information in order to identify appropriate alternatives and mitigating measures.

I. Statements of Interest

Biofuelwatch provides information, advocacy and campaigning in relation to the climate, environmental, human rights and public health impacts of large-scale industrial bioenergy. Central to the Biofuelwatch mission is promoting citizen engagement in environmental decision making in relation to bioenergy and other bio-based products – including bioenergy-related decisions on land use and environmental permitting.

Community Energy reSource offers independent pollution prevention, environmental justice, and energy systems science for communities and workers on the frontlines of today's climate, health, and social justice crises. Its work focuses on assisting communities with a just transition from oil refining and fossil power to clean, safe jobs and better health.

Natural Resources Defense Council ("NRDC") is a nonprofit environmental membership organization that uses law, science, and the support of more than 440,000 members throughout the United States to ensure a safe and healthy environment for all living things. Over 2,200 of NRDC's members reside in Contra Costa County, some of those in the City of Rodeo. NRDC has a long-established history of working to ensure proper oversight of refining activities and minimize their carbon footprint and other environmental impacts, and ensure that biofuels are produced in a sustainable manner.

Rodeo Citizens Association is a non-profit environmental organization with the primary purpose of providing a means for the citizens of Rodeo to address issues of local concern with respect to health, safety, and the environment. Currently, RCA's primary activity is focused on promoting responsible use of land and natural resources around the community and to engage in community outreach activities involving education and awareness of environmental protection issues impacting the region.

San Francisco Baykeeper ("Baykeeper") has worked for the past 30 years to stop pollution in San Francisco Bay, and has more than five thousand members and supporters who use and enjoy the environmental, recreational, and aesthetic qualities of San Francisco Bay and its surrounding tributaries and ecosystems. San Francisco Bay is a treasure of the Bay Area, and the heart of our landscape, communities, and economy. Oil spills pose one of the primary threats to a healthy Bay, and environmental impacts from increased marine terminal activity directly threaten Baykeeper's core mission of a Bay that is free from pollution, safe for recreation, surrounded by healthy beaches, and ready for a future of sea level rise and scarce resources. San Francisco Baykeeper is one of 300 Waterkeeper organizations working for clean water around the world. Baykeeper is a founding member of the international Waterkeeper Alliance and was the first Waterkeeper on the West Coast.

The San Francisco Bay Chapter is the local branch of the Sierra Club, America's largest and most effective grassroots environmental organization. The Bay Chapter is comprised of the

nearly 40,000 Sierra Club members who live in Alameda, Contra Costa, Marin, and San Francisco counties. As the trusted local arm of one of the nation's oldest and largest environmental organizations, they are rooted in nearly a century of service to the mission of exploring, enjoying, and protecting the environment. They are committed to seeking oversight on environmental and land use permitting and seek to ensure that energy is produced as sustainably as possible.

The Sunflower Alliance engages in advocacy, education, and organizing to promote the health and safety of San Francisco Bay Area communities threatened by the toxic pollution and climate-disruptive impacts of the fossil fuel industry. They are a grassroots group committed to activating broader public engagement in building an equitable, regenerative, and renewable energy-fueled economy.

350 Contra Costa is a home base and welcoming front door to mobilize environmental activism. It is comprised of concerned citizens taking action for a better community. They envision a world where all people equitably share clean air, water and soil in a healthy, sustainable, and post-carbon future. It is a local affiliate of 350 Bay Area**.**

II. Scoping Comments Overview

The breadth of the California Environmental Quality Act (CEQA) review the Project requires is hard to overstate. While the Project is billed by its proponent as a means of reducing environmental impacts, for reasons explained in these Comments, there are multiple sound reasons to believe that the Project may, in fact, result in new and/or increased environmental impacts that must be evaluated in the EIR. The very scale of the Project, including multiple construction and operational components, underscores the challenge presented in preparing the EIR. The Project includes, among others, the following:

- A multi-facility decommissioning of four major crude oil processing and support facilities spanning 200 miles and ten counties.[2]
- A feedstock switch unprecedented at the Rodeo refinery, from petroleum hydrocarbons to agriculture-derived triacylglycerols (TAGs) and their fatty acids.
- An unprecedented concentration of biofuel production from that feedstock using repurposed hydrotreaters and hydrocrackers in a single refinery.
- Unprecedented demand for food system-supplied feedstock coming into Contra Costa County, and associated transport to the Rodeo refinery.

[2] *See* Application at 1-2, 9-16. Petroleum refining would be fully decommissioned across the Phillips 66 San Francisco Refinery (SFR), including its Santa Maria Facility (SMF) in San Luis Obispo County and its Rodeo Facility and Carbon Plant in Contra Costa County, and the Phillips 66 pipeline system that sends semi-refined crude from the SMF to Rodeo along with whole crude collected from the San Joaquin Valley for refining at Rodeo would be Idled. This proprietary pipeline system runs through parts of San Luis Obispo, Santa Barbara, Kern, Kings, Fresno, Merced, Stanislaus, San Joaquin, Alameda, and Contra Costa counties. The part of this P66 pipeline system that collects otherwise landlocked (and dwindling) crude extracted from onshore and offshore Central Coast oil fields for partial processing at the SMF is in San Luis Obispo County and (along with or in addition to its feeder lines) Santa Barbara County.

- Fundamental changes at the Rodeo refinery in fuels processing equipment, configuration, process materials and inputs, processing chemistry, reactor process conditions, and process control needs—including but not limited to unprecedented hydro-conversion refining intensity.
- New multi-facility feedstock transportation and coordination issues during implementation of the Project affecting facilities, people and environments in multiple counties.[3]
- A pivotal choice between fossil fuel-based production methods versus renewable hydrogen-based fuels production, which could be locked into place for the duration of project operation and set precedents for other planned and proposed biofuel projects.

As discussed in the sections below, the Project is likely to result in multiple new and in some cases greater environmental impacts, including many that appear likely to be significant in the absence of measures to lessen or avoid them. These include the following:

- *Indirect Land Use Changes*. The EIR will need to either definitively identify the feedstocks the Project will employ, backed up by a binding commitment by Phillips 66, or else assume a worst case scenario in terms of feedstock impacts on land use - which can include not only carbon intensity impacts but other environmental harms.
- *Food system impacts*. In the absence of binding assurance that the Project will not use food-system feedstock, the EIR should evaluate the impact of use of large quantities of such feedstocks on food prices, food insecurity, and food systems more generally.
- *Impact on California electrification policies*. The EIR should consider the impact of an increased biofuels supply on California's vehicle electrification goals – both in terms of the Project impacts and cumulative impacts together with other planned and possible refinery biofuels conversions.
- *Transportation impacts*. The Project envisions importation of feedstocks via a suite of transportation methods replacing the pipeline imports through which most feedstock is brought into the Rodeo refinery. The impacts of that transportation shift must be evaluated in the EIR.
- *Oil spill risks*. The proposed increased importation of crude oil over the Rodeo marine terminal during the Project construction phase carries with it the increased risk of oil spills into the Bay.
- *Process safety risks*. Producing biofuels on repurposed crude oil refining equipment requires increased hydrogen throughput, which in turn increases the risk of process upsets. That risk must be evaluated in the EIR.
- *Site decommissioning impacts*. The EIR should evaluate the impact of decommissioning the Santa Maria facility and portions of the Rodeo facility, and identify means of minimizing or mitigating those impacts.

[3] Sequencing of construction and decommissioning activities would need to be coordinated with idling the pipeline system crossing parts of the counties noted above. Additionally, as explained *infra* in this Comment, the Bay Area counties and others would be affected by increased transportation-related risks such as spills.

In addition, it will be critical for the EIR to identify the proper baseline against which to compare Project alternatives – the "no project" alternative required by CEQA. It is by no means clear that the "no project" alternative would be business as usual, *i.e.*, indefinitely continued crude oil refining at the Santa Maria and Rodeo refineries. There is substantial evidence that Phillips 66 plans to decommission the Santa Maria refinery regardless of whether the Project is approved, meaning that the proper "no project" baseline would be zero refining at Santa Maria, and any concomitant decrease in refining at Rodeo that would occur in the absence of the proposed Project-related increase in imports over the marine terminal wharf.

By the same token, the EIR must evaluate a suite of alternatives aimed at minimizing project impacts, and one such alternative should be to disallow the increased importation over the wharf. Phillips 66 has provided no rational justification for that increase, given that during construction the refinery will be extremely limited in its ability to process crude.

Finally, as discussed in the next section, the EIR should address the purported "existing production" of biofuels at the Rodeo refinery, and its impact on production volume and associated environmental impacts.

III. The EIR Should Address the Purported "Existing Production" of Biofuels that Significantly Alters Production Capacity.

Project biofuel capacity at the Rodeo refinery is given as 55,000 barrels per day.[4] However, the NOP describes total biofuel production at the Rodeo refinery as 21.8 % higher than that, at 67,000 b/d.[5] The difference is explained in the NOP by previously undisclosed "existing production" of biofuels at the Rodeo refinery.[6] The previously undisclosed 12,000 b/d of "existing" biofuel production is unexplained in the NOP, and County staff assert that at this time, the County has no additional information about this "existing" biofuel production.[7]

Significant differences in the level of impacts – including air emissions, climate impacts, water discharge impacts, oil spill risk, refinery spill/fire/explosion risk, and impacts associated with feedstocks such as volume-linked pesticide, biodiversity, deforestation, and food security impacts – could result from the difference represented by the 21.8% discrepancy in project size. It is well known, and can be readily inferred from the information presented in the discussion of impacts below, that potential environmental impacts increase with activity rate. Air emissions that affect public health and climate increase with the activity rate—in this case the number of barrels processed—at a given specific emission source and set of controls. The same applies to wastewater pollutant discharges. Biofuels and feedstock oil spill risks increase with their volumes transported, stored and processed. Biofuel refinery process hazards worsen as larger volumes of material are processed under the same high temperature, high-pressure hazardous conditions. Similarly, feedstock acquisition-related impacts will tend to increase as more biofuel

[4] NOP at 2.
[5] NOP at 2.
[6] *Id.*
[7] Telephone communication between Gary Kupp and Greg Karras, January 14, 2021. *See* also 21 Jan. 2021 response by Lawrence Huang to 6 Jan. 2021 request for project application and supporting documents by Greg Karras.

feedstock—in this case mainly oil crops and fats from livestock fed by crops—is processed, and consequently is acquired. In particular, use of food-based oils can boost food prices; and increased feedstock crops yields require more land, pesticides or both, which further cuts into limited forest and biodiversity resources.

It is hence imperative that the EIR reflect a determination whether the "existing" production should be treated as part of the current Project under the requirements of CEQA, and if so, evaluate the 21.8% higher production capacity that it represents. Even if it is not, it should be evaluated as part of an EIR cumulative impacts analysis.

IV. The EIR Should Determine the Extent to Which the Santa Maria and Rodeo Refineries Would Continue Operation Under the "No Project" Alternative

In examining range of alternatives, an EIR is required to include a "no project" alternative that serves as a baseline for assessing the impact of the remaining alternatives. "The purpose of describing and analyzing a no project alternative is to allow decisionmakers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. ..." CEQA Guidelines,[8] § 15126.6, subd. (e)(1). "The 'no project' analysis shall discuss the existing conditions ... as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. ..." (CEQA Guidelines, § 15126.6, subd. (e)(2).) It is essential that the "no project" alternative accurately reflect the status quo absent the project, to ensure that the baseline for measuring project impacts is not set too high, which would artificially diminish the magnitude of Project impacts. *See Ctr. for Biological Diversity v. Dep't of Fish & Wildlife*, 234 Cal.App.4th 214, 253 (2015) (citation omitted) (emphasis in original) ("a no project alternative in an EIR "provides the decision makers and the public with specific information about the environment if the project is not approved. It is a factually based forecast of the environmental impacts of *preserving the status quo*. It thus provides the decision makers with a base line against which they can measure the environmental advantages and disadvantages of the project and alternatives to the project.")

Here, there is potential basis to conclude that the Phillips 66 Santa Maria refinery and Rodeo refinery might both reduce or cease their crude processing operations in the relatively near term even if the County does not approve the Project, due to supply limitations and the increasingly poor economics of crude oil refining. If such is the case, then the "no project" status quo alternative is not indefinitely continued crude oil refining, but rather a slowdown or shutdown of one or both facilities. This would mean that the Project would not achieve all - or possibly any – of the claimed emissions reductions set forth in the Project application; and might, in fact, increase emissions significantly over the baseline. It is hence critical that the County, in defining the "no project" alternative, carefully scrutinize any claims on the part of Phillips 66 that it would continue operation of its refineries in the absence of the Project.

The Application assumes closure of the Phillips 66 Santa Maria refinery, which currently sends Rodeo feedstock via pipeline. It asserts that Phillips 66 needs authorization to increase

[8] The CEQA Guidelines are codified at 14 Cal.Code Regs. § 15000 et seq.

crude and gas oil imports over its Rodeo marine terminal by up to 73,818 barrels per day[9] (b/d) until its biofuel conversion is built and fully online,[10] "to accommodate the idling and decommissioning of the Santa Maria facility in San Luis Obispo County."[11]

However, the Application does not specifically identify closure of the Santa Maria refinery as a component of the Project.[12] Statements and actions by Phillips 66 in other contexts indicate that slowdown or cessation of crude processing at that facility is likely not, in fact, a proposed Project action, but rather a description of what will happen whether or not the County approves the Project. Phillips 66 pulled its application for a pipeline replacement project associated with the Santa Maria refinery upon announcement of the Project in August, evidence that it plans to close or reduce production at that refinery regardless of whether the Project Application is approved.[13] Additionally, Phillips 66 has stated in other project applications since 2013 that dwindling crude oil supplies are threatening its ability to maintain production at both the Santa Maria and the Rodeo facilities - the Rodeo facility being dependent upon the Santa Maria facility for a significant share of its feedstock.[14] These types of assertions underpinned both Phillips 66's proposal to bring in crude oil by rail to the Santa Maria facility, and its later proposal to expand crude oil delivery over its Rodeo marine terminal.[15] Neither proposal was ever approved, such that the referenced supply crunch used to justify those proposals likely still exists, and still threatens the continued operations of one or both refineries as part of baseline "no project" conditions.

Indeed, since the time Phillips 66 made these proposals, available crude feedstock for the Santa Maria refinery has diminished even further. Combined onshore and offshore oil extraction from Central Coast oil fields that the Santa Maria facility has relied upon declined dramatically since 2014, falling to annual volumes below the capacity of the Santa Maria facility.[16] That

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[9] The current marine terminal input limit is 51,182 b/d, and Phillips 66 proposes to increase that limit up to 125,000 b/d. NOD at 3.

[10] The increase would be from the current marine terminal input limit of 51,182 barrels per day (b/d) limit now to 125,000 b/d.

[11] Application at 12.

[12] *Id.* at 11-12 (listing Project components).

[13] "Phillips 66 Plans 2023 Closure of Santa Maria Refinery, Pulls Application for Pipeline Project," *Noozhawk* August 13, 2020, *available at* https://www.noozhawk.com/article/phillips_66_closure_of_santa_maria_refinery_planned_for_2023_20200813.

[14] The Santa Maria facility provides an average of approximately 33,000 barrels per day of semi-refined crude to the Rodeo facility via pipeline.

[15] Phillips 66 Company Rail Spur Extension and Crude Unloading Project, SCH#2013071028. *See e.g.*, Revised Draft Environmental Impact Report (RDEIR) at ES-16 (less crude available than needed to operate at capacity without proposed project) and project description at 2-36 ("need for the SMR rail project could be driven by declines in local production of crude oil that can be delivered by pipeline"); and BAAQMD Application No. 25608, Phillips 66 Marine Terminal Permit Revision Project. *See also* September 6, 2019 correspondence from Carl Perkins, Phillips 66, to Jack Broadbent, BAAQMD (failure to increase oil inputs through the marine terminal "could lead to processing rate curtailments.")

[16] Extraction from these fields fell from approximately 83,500 barrels per day in 2014 to approximately 39,100 b/d in 2019. This is based on California Energy Management Division (CalGEM) oil field location data and California Air Resources Board (CARB) refinery crude inputs by oil field. Data from the following oil fields were included in this estimate: Arroyo Grande, Barham Ranch, Carpinteria (Federal OCS), Casmalia, Cat Canyon, Cuyama South, Dos Cuadras (OCS), Elwood, Elwood South Offshore, Goleta, Guadalupe, Hondo (OCS), Hueneme (OCS), Jesus Maria, Las Varas Canyon, Lopez Canyon, Los Alamos, Lynch Canyon, McCool Ranch, Monroe Swell, Morales Canyon, Pescado (OCS), Point Arguello (OCS), Point Pedernales (OCS), Orcutt, Paris Valley, Russell Ranch,

trend could significantly reduce the viability of the Santa Maria facility, which is landlocked with no seaport access to crude,[17] and was running at less than 87% capacity even before 2014.[18] When that facility cannot economically acquire enough crude oil – which appears to be what is happening now – it must cut production. Diminished output at the Santa Maria facility, in turn, inhibits production at the Rodeo facility by curtailing Santa Maria facility output and because the Rodeo facility cannot receive Kern County crude oil through the Phillips 66 pipeline between the two facilities unless it is diluted with the lighter Santa Maria output that allows the heavy Kern crude to flow through the pipeline.[19] In that scenario – which may well be the "no project" scenario – the Rodeo plant must either import more oil over its marine terminal or cut production.

Finally, both refineries are impacted by the overall increasingly poor profit margins of crude oil refining, which has led to the closure, or conversion to biofuels production, of numerous refineries in California and throughout the nation. Refinery profits across the nation have been declining since before the COVID pandemic.[20] Refineries are closing or converting to biofuel production in the United States and throughout the world, and there is significant doubt whether the economics of refining will improve post-pandemic.[21] The International Energy Agency (IEA) reported in November 2020 that roughly a dozen refinery closures had been announced in the previous few months, with the bulk of the capacity closures – over 1 million

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Sacate (OCS), San Ardo, Santa Clara (OCS), Santa Maria Valley, Sargent, Sisquoc Ranch, Sockeye (OCS), Vallecitas, and Zaca. The CalGEM data were taken from (https://maps.conservation.ca.gov/oilgas/). The CARB data were taken from supporting documentation for Final California Crude Average Carbon Intensity Values during 2014 through 2019 (https://ww2.arb.ca.gov/resources/documents/lcfs-crude-oil-life-cycle-assessment). San Luis Obispo County reported an air district-permitted Santa Maria facility crude capacity of 48,000 b/d as of late 2014. *See* ; Phillips 66 Company Rail Spur Extension and Crude Unloading Project, SCH#2013071028 RDEIR, Project Description at p. 2-35.

[17] Phillips 66 Company Rail Spur Extension and Crude Unloading Project, SCH#2013071028. *See e.g.*, RDEIR Project Description, pp. 2-31 and 2-33 (stating that as of 2014 "SMR currently receives all crude oil for processing by pipeline ... . The bulk of the crude oil processed at the SMR comes from offshore platforms in the Outer Continental Shelf of Santa Barbara County and from [onshore] oil fields in the Santa Maria area ... some onshore areas, such as the Arroyo Grande" [and San Ardo oil fields; Only a fraction of its crude supply is delivered by truck from the San Joaquin Valley to Santa Maria and loaded into its pipeline input including "Canadian crude [that] is shipped via rail to a crude unloading facility near Bakersfield" and accounted for 2–7% if its crude supply circa 2013–2014.); pp. 2-35 and 2-36 ("This pipline system is currently the only way that the Phillips 66 refinery can receive crude oil. Crude oil can be trucked to the Santa Maria Pump Station and then placed into the pipeline for delivery to the refinery. Truck delivery to the Santa Maria Pump Station is limited to a permitted maximum of 819,000 gallons (26,000 bbls) per day ... ").

[18] Phillips 66 Company Rail Spur Extension and Crude Unloading Project, SCH#2013071028, RDEIR Project Description at p. 2-35 (stating based on 48,000 b/d capacity and 2009–2013 throughputs of 35,838–41,635 b/d that "The SMR currently processes less than their allowable permit levels.").

[19] The viscosity (resistance to flow) of San Joaquin Heavy crude impairs its uncut flow through unheated pipelines, and while other lines are heated to move it, the Phillips 66 Pipeline to Rodeo is not, relying instead on Santa Maria facility output of less viscous pressure distillate and gas oil as a cutter to move that crude through its pipeline to Rodeo. As noted *supra,* Phillips 66 proposes to idle this pipeline when it decommissions the Santa Maria plant.

[20] "Bad News for Oil: Refinery Profits are Sliding," *Oilprice.com* January 13, 2020, *available at* https://oilprice.com/Energy/Oil-Prices/Bad-News-For-Oil-Refinery-Profits-Are-Sliding.html.

[21] *See* "Factbox: Oil Refiners Shut Plants as Demand Losses May Never Return," *Reuters* November 10, 2020, *available at* https://www.reuters.com/article/us-global-oil-refinery-shutdowns-factbox/factbox-oil-refiners-shut-plants-as-demand-losses-may-never-return-idUSKBN27R0AI; "Refinery News Roundup: Refinery Closures Loom," *Platts S&P Global* November 12, 2020, *available at* https://www.spglobal.com/platts/en/market-insights/latest-news/oil/111220-refinery-news-roundup-refinery-closures-loom-across-the-globe.

b/d – happening in the United States. IEA stated in its monthly report, "There were capacity shutdowns planned for 2020-2021 prior to COVID-19, but the bulk of the new announcements reflect pessimism about refining economics in a world suffering from temporary demand collapse and structural refining overcapacity."[22]

Structural factors that underly this trend, accelerated by COVID-19, are especially pronounced in the U.S. at West Coast refineries.[23] Growth reversed years ago in both the crude supply and the market that California refineries were first built to tap.[24] Refiners statewide reacted by *increasing* production through increasing reliance on oil imports and export fuels markets.[25] The sustainability problem with that path-dependent reaction was further revealed by COVID-19. From March 20, 2020 through January 15, 2021 fully one-fourth of statewide refining production became unproductive assets as a side effect of the pandemic, which paused personal travel.[26] Phillips 66 faces this statewide overcapacity problem, along with the rapid terminal decline of site-specific crude resources that its refining facilities were built for and remain uniquely dependent upon.

If, in fact, the Santa Maria refinery and/or the Rodeo refinery are being forced by current circumstances to limit or cease crude oil production, then the "no project" alternative would likely have less environmental impact than any Project alternative. It is thus crucial that the County assess complete information concerning the volume of crude that would be refined at the Santa Maria and Rodeo facilities – if, indeed, any would be – in the absence of the Project.

V. The EIR Should Consider the Full Array of Risks and Impacts of the Project

The Application contains virtually no information concerning project environmental impacts. It sets forth bare claims regarding Project-related environmental effects – in particular concerning a purported reduction in air emissions – but provides no citations, data, or calculations in support.[27] It contains no indication of the types of feedstock that will be used, even though, as explained below, environmental impacts vary broadly with the choice of feedstock. Additionally, no CEQA Initial Study has yet been performed for the Project, as was done for the biofuel conversion project proposed for the Marathon Martinez refinery.[28]

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[22] "Permanent Oil Refinery Closures Accelerate as Pandemic Bites – IEA," *Reuters* November 12, 2020, *available at* https://www.reuters.com/article/oil-refining-shutdowns/permanent-oil-refinery-closures-accelerate-as-pandemic-bites-iea-idUSL1N2HY13P.

[23] *See* Justin Mikulka, "Oil Companies Can't Find Any Buyers for Refineries Struggling Amid Pandemic Crisis," *Desmog* November 23, 2020, *available at* https://www.desmogblog.com/2020/11/23/oil-refinery-industry-stranded-assets-pandemic#:~:text=Search-,Oil%20Companies%20Can't%20Find%20Any%20Buyers,Refineries%20Struggling%20Amid%20Pandemic%20Crisis&text=Major%20players%20in%20the%20U.S.,sell%20refineries%2C%20with%20little%20luck; "Bad News for Oil: Refinery Profits are Sliding," *Oilprice.com* January 13, 2020, *available at* https://oilprice.com/Energy/Oil-Prices/Bad-News-For-Oil-Refinery-Profits-Are-Sliding.html.

[24] G. Karras, *Decommissioning California Refineries: Climate and Health Paths in an Oil State* at 20, *available at* https://www.energy-re-source.com/decomm (April 2020) and supporting material (Karras 2020).

[25] Karras 2020 at 21.

[26] *COVID and Oil,* Community Energy resource, *available at* www.energy-re-source.com/covid-and-oil.

[27] Application at 14-16.

[28] Initial Study for Tesoro Refining & Marketing Company LLC – Marathon Martinez Refinery Renewable Fuels Project, submitted to Contra Costa County October 2020.

While Phillips 66 has not yet been forthcoming with information concerning potential impacts, such information is available, and should be collected and thoroughly explored by the County in the process of preparing the EIR. Below are descriptions of a few key areas of environmental impact that merit particular focus.

A. Indirect Land Use Change Associated with Feedstock Choice

Information concerning the feedstock that will be used for the Project, not yet provided to the County in any reliable manner, is critical to assessment of the Project's impacts, given that carbon emissions and other air emissions vary significantly with the type of feedstock used – indeed, such differences are an underpinning of California's Low Carbon Fuel Standard (LCFS). It is therefore essential that Phillips 66 either commit to use of a particular suite of feedstocks prior to preparation of the EIR, or that the EIR assume a worst-case scenario with respect to such feedstock choices. For instance, if Phillips 66 is not prepared to enter into a binding commitment not to use highly carbon-intensive palm oil as a feedstock, then the EIR analysis should assume that palm oil will be used, regardless of any informal and non-binding statements by Phillips 66 that it will not be.

In evaluating feedstocks, and any claims that Phillips 66 may make concerning them, the County should consider the actual availability of such feedstocks on the market. Currently, availability of some of the possibly less environmentally problematic feedstocks, in particular waste cooking oil, may be highly limited – not only due to current pandemic conditions (which have limited restaurant operation and waste output), but more generally due to the influx of biofuel producers into the market.[29] Camelina grass may be a lower-impact feedstock as well, but supplies are likewise currently somewhat limited, and no commercial commodity channels currently exist for its marketing and utilization in the U.S.[30] Any claims by Phillips 66 at this juncture to use a particular feedstock, to the extent not backed up by a binding commitment, may thus prove illusory if market supply of the identified feedstock is not available.

A number of feedstocks, including most notably food-grade soy oil, raise the specter of significant impacts from indirect land use change (ILUC). Recent research concludes that soybean production may be indirectly contributing to deforestation in the Amazon region and elsewhere.[31] Even if Phillips 66 were to commit to domestic sourcing of feedstock soybean oil, the commodity is internationally traded, such that the market impact of a large new commercial

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[29] *See* "California Restaurants are Hurting. That Means Less Leftover Cooking Oil to Make Biofuels," *San Francisco Chronicle* December 13, 2020, *available at* https://www.sfchronicle.com/business/article/California-restaurants-are-hurting-That-means-15796514.php; "Facing Wave of Closures, Oil Refiners Turn to Biofuels," *Reuters* October 19, 2020, *available at* https://www.reuters.com/article/europe-refining-idUSKBN2742CX,

[30] *See* Camelina for Biofuel Production, *Farm Energy* April 3, 2019, *available at* https://farm-energy.extension.org/camelina-for-biofuel-production/; Oregon State Extension Service, *Economics of Oilseed Crops and their Biodiesel Potential in Oregon's Willamette Valley,* May 2008, *available at* https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/sr1081.pdf.

[31] C. Malins, "Soy, Land Use Change, and ILUC-Risk," *Cerulogy* November 2020 (Malins 2020), *available at* https://www.transportenvironment.org/sites/te/files/publications/2020_11_Study_Cerulogy_soy_and_deforestation.pdf; R. Garr and S. Karpf (Garr and Karpf 2018), *Burned: Deception, Deforestation and America's Biodiesel Policy*, January 2018, *available at* https://www.mightyearth.org/2018/01/09/burned/.

consumer may affect international supply and prices, and further drive any impact on deforestation.[32]

We note, in addition, that carbon intensity (CI) calculations associated with the LCFS are not dispositive of all ILUC impacts. LCFS CI calculations are not designed to capture the full range of impacts associated with deforestation and other land use changes that may be wrought by increased production of biofuel feedstock crops.[33] Those changes do not just affect carbon emissions, but also risk an array of other environmental impacts to habitats, human health, and indigenous populations.[34] Conversion of more natural habitat to cropland is often accompanied by efforts to boost short-term yields by applying more fertilizers and pesticides, thereby destroying habitat needed to reverse biodiversity loss. Indeed, authoritative international bodies have warned explicitly about the potential future severity of these impacts.[35]

Accordingly, the EIR should be grounded in complete modeling data concerning ILUC and other impacts that may result from any feedstock Phillips 66 will be able to run at the refinery, to the extent either the Project design or a binding commitment from the company does not exclude or limit the use of such feedstock. The modeling analysis should consider as parameters, *inter alia,* (i) the price and availability of feedstock sources, assuming varying numbers of biofuel producers and conversions to biofuel production in California and the US, and (ii) the ILUC impacts that will result from use of any given feedstock, by Phillips 66 and cumulatively by other biofuel producers in the present or anticipated future.

The analysis should also consider any other environmental impacts that may vary with feedstock choice, including but not limited to air emissions, as discussed in the sections below.

B. Impact of Food System Feedstocks on Food Supply and Prices

The Project requires use as feedstock of lipids produced and used in the currently existing food system. Except to the extent Phillips 66 can use waste cooking oil – which is in short supply, as described above - the project is likely to require use of food-grade feedstock. Such use would lock Phillips 66 into competition with current users of our food system, boosting food prices and creating a threat to people and communities suffering from food insecurity. Accordingly, it is essential that the EIR include a quantitative analysis of the impact of the Project on food price and availability.

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[32] "Brazil Allows Imported Soy in Biodiesel Production, *United States Department of Agriculture Foreign Agricultural Service,* November 20, 2020 (USDA FAS), *available at* https://www.fas.usda.gov/data/brazil-brazil-allows-imported-soy-biodiesel-production. *See also* R. Fuchs, C. Brown et al., "US-China Trade War Imperils Amazon Rainforest," *Nature* 567(7749):451 (March 2019), abstract *available at* https://www.researchgate.net/publication/332037157_US-China_trade_war_imperils_Amazon_rainforest; "Millions of Acres of the Amazon are at Risk Due to the Trade War Between U.S. and China," *Pacific Standard* April 18, 2019, *available at* https://psmag.com/economics/amazon-could-be-biggest-casualty-of-us-china-trade-war.

[33] "LCFS Land Use Change Assessment," CARB, *available at* https://ww2.arb.ca.gov/resources/documents/lcfs-land-use-change-assessment.

[34] Malins 2020, Garr and Karpf 2018.

[35] IPBES (2019): Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. IPBES: Bonn, DE, *available at* https://ipbes.net/global-assessment; *see esp.* pp. 12, 18, 28.

1. The Project Would Very Likely Use a Significant Volume of Food System Oil

The project would convert existing Rodeo petroleum refining technology into a "Hydrotreating Esters and Fatty Acids" (HEFA) biofuel refinery. HEFA technology feeds lipids, and more specifically, lipids from triacylglycerols (TAGs) and fatty acids cleaved from those TAGs, from biomass. Except for fish oils (a seriously questionable refinery feed), the only HEFA feeds of this type that are available for this in commercially relevant amounts are from land-based food systems. These include oil crops such as soybean, corn (distillers corn oil), canola, rapeseed, and cottonseed oils in the U.S., tropical palm oil, and the like; fats rendered from livestock fed mainly, in the U.S., on oil crop byproducts (beef tallow, "white grease" rendered from pork, and poultry fats); and used cooking or waste oils ("yellow" and "brown" greases) which originate mainly from the oil crops and fats. Recovered cooking and waste oil volumes come nowhere near meeting current biodiesel feedstock demand while rendered animal fats production can supply only a small portion of it despite their partial displacement from exports to make soap, wax, or cosmetics elsewhere.[36]

The volume of feedstock – likely, per above, mostly food-grade or otherwise connected to the food system – that would be required for the Project represents a very significant share of current markets. Preliminary information suggests that oil crop and animal fat demand for U.S. biofuel production totaled approximately 112,000 barrels per day on average over recent years.[37] Project feedstock demand could boost this 112,000 b/d nationwide total by 60–75% (67,000–84,000 b/d).[38] Preliminary information further suggests that U.S. farm yields for all uses of oil crops and animal fats now tapped for biofuels totaled approximately 308,000 b/d on average over recent years.[39] Thus, by boosting total U.S. biofuel production feedstock demand to 179,000–

[36] *See generally* G. Karras, *Biofuels: Burning Food?,* Community Energy resource, *available at* https://f61992b4-44f8-48d5-9b9d-aed50019f19b.filesusr.com/ugd/bd8505_a077b74c902c4c4888c81dbd9e8fa933.pdf, and sources cited therein (and accompanying these Comments).

[37] U.S. Energy Information Administration (EIA). Monthly Biodiesel Production Report, Table 3. Inputs to biodiesel production; www.eia.gov/biofuels/biodiesel/production/table3.xls. This 112,000 b/d estimate is based on all data from Jan. 2018–Oct. 2020 from this table. Data were converted from mass to volume based on a specific gravity relative to water 0.916 for the combined lipid feedstocks.

[38] The NOP gives only a fuels production capacity (up to 67,000 b/d). NOP at 2. *See* also Section III herein for context. The 84,000 b/d is an upper bound estimate made necessary by a series of omissions that would otherwise compound an apparently misleading assumption carried forward in the NOP, as detailed in subsection D below. The range of project percentage boost over existing biofuel production is from 67,000 b/d, then 84,000 b/d, divided by that 112,000 b/d existing production.

[39] This 308,000 b/d estimate is from two sources. First, data were taken from the U.S. Department of Agriculture (USDA) "Oil Crops Data: Yearbook Tables." *See* https://www.ers.usda.gov/data-products/oil-crops-yearbook/oil-crops-yearbook/#All%20Tables.xlsx?v=7477.4. Specifically, from Oct. 2016 through Sep. 2019 average total U.S. yields were: 64.0 million pounds per day, or 8.34 million gallons per day (MGD) at a specific gravity (SG) of 0.920 for soybean oil (*see* i below), 4.51 MM lb/d or 0.591 MGD at 0.915 SG for canola oil (ii), 16.1 MM lb/d or 2.09 MGD at 0.923 SG for corn oil (iii), 1.42 MM lb/d or 0.185 MGD at 0.923 SG for Cottonseed oil (iv), and 8.65 MM lb/d or 1.20 MGD at 0.86 SG for tallow and lard combined (v). The mass-based yields data are from the USDA Oil Crops Yearbook tables identified in this note below, which are attached with this comment. Second, we estimated total U.S. production of other oils, predominantly used or waste cooking oils, based on data described in Zhou et al., 2020. Potential Biomass-based Diesel Production in the United States by 2032, *available from* The International Council on Clean Transportation: Beijing, Sao Paulo, Berlin, San Francisco and Washington, *at* https://theicct.org/publications/potential-biomass-based-diesel-production-united-states-2032. This preliminary estimate is provided here to underscore the need for further study of related impacts. *See* USDA Oil Crops Yearbook (OCY) data tables (i) OCY Table 5, (ii) OCY Table 26, (iii) OCY Table 33, (iv) OCY Table 20), (v) OCY Table 32.

196,000 b/d, Project feedstock demand could contribute to committing as much as 58–64% of total U.S. farm yield for *all* uses of these oils and fats to biofuel production.

Moreover, the Project would supply biofuels primarily to the California fuels market.[40] That could commit 22–27% of total U.S. farm yield for all uses of crop oils and rendered animal fats, including exports (biofuels are only one use of this yield) to California alone[41]—roughly twice the U.S. per capita yield of these oils and fats for all uses.[42] Thus, project feedstock demand would commit resources that other states and nations now use in their food systems, and would need to use more of, for the type of biofuel technology used by the project to be a viable climate solution.

2. Use of Large Volumes of Food System Oil Could Have Significant Impacts on Food Markets that the EIR Must Analyze

Given the high volumes of oils connected to the food system likely to be used as feedstock for the Project, the Project would compete with other uses of oil crops and the food systems they support—and would compete at unprecedented scale, given its unparalleled size. This competition would risk raising food-grade commodity prices and hence food prices, with an associated cascade of impacts on persons and communities suffering from food insecurity. Indeed, the price of soybean oil – currently used in biofuel production – is already "spiraling."[43] Currently available documents concerning the Project, including the Application, do not mention this issue despite its importance to environmental review.

Additionally, beyond impacts on the market for the particular feedstock used, spillover effects of project-driven price increases would affect other parts of the food system. We eat many types of food, and choose which to eat, based in part on what costs us more to buy. People may buy and consume more palm oil when soy oil gets more expensive. Similarly, manufacturers can adjust their recipes to use another crop for lipid, triacylglicerol (TAG) or fatty acid inputs, as prices for one type of crop oil increase. This fungibility among various oil crop products means that their prices are significantly if not wholly linked. Thus, project demand for

[40] NOP at 2; Application at 2, 9.

[41] From 67,000-84,000 b/d of project demand for 308,000 b/d of yield as estimated based on USDA data a described above. We further note that separately, and based on another biofuel feedstock supply data base, experts commissioned by California agencies found that California may already use its share of low-carbon biofuel feedstocks. *See:* Mahone et al., 2020. *Achieving Carbon Neutrality in California;* PATHWAYS Scenarios Developed for the California Air Resources Board. Draft. Energy+Environmental Economics Inc.: San Francisco, CA; and Mahone et al., 2018. *Deep Decarbonization in a High Renewables Future, Updated Results from the California PATHWAYS Model;* CEC-500-2018-012. Final Project Report prepared for the California Energy Commission by Energy+Environmental Economics Inc.: San Francisco, CA.

[42] Importing biofuel feedstock from another state or nation which is needed there to help decarbonize its economy could make overreliance on biofuels to help decarbonize California's economy counterproductive as a climate protection measure. Accordingly, expert advice commissioned by state agencies suggests limiting the role of biofuels within the state's decarbonization mix to the state's per capita share of low-carbon biofuel feedstocks. *See* Mahone et al. 2020 and 2018. On this basis, given California and U.S. populations of 330 and 39.5 million, respectively, California's total share of U.S. farm production (for all uses) of plant oils and animal fats which also are used for biofuels would be approximately 12%. As described in the note above, however, the project could commit 22–27% of that total U.S. yield (for all uses) to biofuels produced at Rodeo alone.

[43] USDA FAS.

one type of oil crop feedstock could increase food system prices not only for that crop but others as well. There are observed links between rising prices for one oil crop in one country and expanding production of another oil crop somewhere else.[44]

Accordingly, it is imperative, in providing a full evaluation of Project impacts, that the EIR evaluate all effects of use of potential food-grade feedstocks on food prices, food insecurity, ILUC, biodiversity, and the food system overall. The analysis should include economic modeling of food price impacts of various possible food-system feedstock choices, taking into account the fungibility of food commodities. The modeling needs to take into account global markets to the extent relevant products are internationally traded; and must consider cumulative impacts of other biofuel producers competing for food system feedstocks.

C. Impact of Increased Biofuel Supply on Vehicle Electrification Policies

As noted above, Phillips 66 is one of many crude oil producers in California and the nation turning to biofuel production in the wake of declines in crude oil refining profitability. There is the possibility, in principle, that a surfeit of biofuel production, and the resulting downward impact on price, could create market forces and structural impediments[45] that undermine California's stated aim of electrifying the transportation sector,[46] as well as the Diesel Free by 33 pledge signed by Contra Costa County, which commits the County to, *inter alia,* "Use policies and incentives that assist the private sector as it moves to diesel-free fleets and buildings."[47] The County should therefore model the impact of increased biofuel supply, from Phillips 66 and cumulatively from other existing and reasonably anticipated biofuel producers, on fleet electrification; and assess the emissions consequences of any such impact.

D. Increased Transportation Impacts

Rodeo facility crude and gas oil inputs were (pre-COVID) primarily via pipeline, with virtually all of the balance—less than 52,000 b/d—via marine vessels calling on the Rodeo marine terminal. In contrast, Project biofuel feed and petroleum oil inputs would all be via truck, train, or marine vessel; and as discussed *supra,* Phillips 66 would not use its pipeline to bring in Project feedstocks. Thus, the Project would result in a feedstock and terminal oils input transport mode shift, from primarily pipeline transport to a combination of continued marine vessel transport and new oil inputs transport to Rodeo via train and truck.

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[44] *See* S. Searle, "How rapeseed and soy biodiesel drive oil palm expansion," July 2017 (Searle 2017). The International Council on Clean Transportation: Beijing, Sao Paulo, Berlin, San Francisco and Washington, *available at https://theicct.org/publications/how-rapeseed-and-soy-biodiesel-drive-oil-palm-expansion;* Sanders et al., "Revisiting the Palm Oil Boom in Southeast Asia: The Role of Fuel versus Food Demand Drivers," 2017 (Sanders et al. 2017). International Food Research Institute: Washington, D.C., *available at* https://www.ifpri.org/cdmref/p15738coll2/id/126838/filename/127049.pdf.

[45] For example, competition with hydrogen-fueled trucking and shipping could impede growth in solar and wind power by slowing growth in the storage of energy from those intermittent sources as hydrogen in vehicles.

[46] Executive Order N-79-20 dated September 23, 2020, *available at* https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-text.pdf.

[47] *See* https://dieselfree33.baaqmd.gov/ (landing page), https://dieselfree33.baaqmd.gov/statement-of-purpose (text of the pledge), https://dieselfree33.baaqmd.gov/signatories (signatories).

Transporting oils via truck, train, or marine vessel is generally known to emit more per barrel-mile and result in higher spill, fire, and explosion incident hazards than transporting oils via pipeline. Therefore, by shifting to higher-emission, higher-hazard transport modes, the project would result in higher per-barrel feedstock transportation emissions and hazards as compared with pre-COVID refinery operation.

In addition to increased impact per barrel, total project input volume via truck, train and ship would increase for at least two reasons, explained below.

First, as compared with total average pre-COVID crude and gas oil inputs of less than the 51,182 b/d permitted terminal capacity, biofuel feedstock inputs could substantially exceed the high-end (*i.e.*, including "existing" production) 67,000 b/d total average fuels production capacity described in the NOP.[48] This is because the one-step "parallel" hydro-conversion configuration P66 appears to propose[49] would likely achieve a lower feed-to-biofuel conversion efficiency than a two-step "serial" hydro-conversion configuration (which is feasible, and appears to be proposed by Marathon in its biofuel conversion, for example). Even if project conversion efficiency exceeds the low end of the range reported for this type of biofuel technology at 80%, that means feedstock is 125% of fuels produced. Project feedstock volume remains undisclosed—another critical problem that the EIR must redress—but appears likely to exceed 67,000 b/d and potentially reach 84,000 b/d.

Second, the Project component that would convert existing Rodeo facilities to a petroleum storage and transfer facility when petroleum processing ceases at Rodeo would require inputs of those petroleum oils for that storage and transfer. The NOP informs the volume of this additional oil input indirectly, giving total project transportation product deliveries *from* the Rodeo project of approximately 105,000 b/d including 67,000 b/d of biofuels production.[50] Since the project would not process petroleum, the same volume of oil would be sent into this transfer and storage terminal on average as that sent out of it. Thus, approximately 38,000 b/d of petroleum inputs would add to the 67,000–84,000 b/d of biofuel feedstock inputs. Thus, a total of 105,000–122,000 b/d of biofuel feedstock and petroleum would be transported to Rodeo via marine vessel, train and truck. This compares with less than 52,000 b/d of current (pre-COVID) crude and gas oil inputs arriving via vessel, train and truck combined, with virtually all of that volume via marine vessel.

Meanwhile "total transportation product" (petroleum and biofuel oils) delivered from the Rodeo refinery would remain "approximately the same" according to the NOP.[51] Therefore, by more than doubling the volume of total inputs delivered by higher emitting, higher-hazard transport modes, the project would result in an increase in transportation emission and hazard impacts as compared with pre-COVID Rodeo refinery operations.

Additionally, Project biofuel feedstock oils would come from new sources in new locations, and thereby reach the Rodeo refinery gate via truck and train along new Rodeo

[48] NOP at 2.
[49] Application Figure 6.
[50] NOP at 2.
[51] NOP at 2.

refinery feedstock transportation routes. Project petroleum oil inputs via rail and truck for the petroleum products storage and transfer facility component of the project, which the existing oil input pipeline would no longer serve, also would need to reach the Rodeo facility via new oil input transport routes. Thus, new environments and populations along the new routes would be impacted by higher emitting, higher-hazard oils transport modes—populations and environments which were not directly affected by these refinery transportation impacts before the project. Therefore, currently available information indicates a reasonable potential for significant localized project transportation emission and hazard impacts.

Accordingly, it is imperative that the EIR consider all potentially heightened transportation impacts and means to mitigate them, including, *inter alia* (i) increased air emissions impacts, (ii) increased spill and other hazard risks (discussed in more detail in the next subsection), and (iii) impacts on communities in proximity to transportation infrastructure.

E. Oil Spill and Other Risks Associated with Marine Terminal Operations

The Phillips 66 Refinery in Rodeo has been trying for many years to expand its wharf/marine terminal operations to take advantage of cheap heavy Canadian tar sands crude oil.[52] The present application essentially incorporates a previous application to the Bay Area Air Quality Management District (BAAQMD), which received substantial comments. Those comments are incorporated here by reference as they are applicable to consideration of the oil spill risks posed by the proposed expansion of operations at the Marine Terminal.[53]

The EIR must consider and explore the full range of impacts from expanded marine terminal operations, including the risk of a catastrophic oil spill. This is especially true because, as discussed *infra* Section VI.A, the Project's description of a transition to biofuels does not require any "temporary" increase in marine terminal capacity. The proposed, and unnecessary, "temporary" increase could be used to bring in higher volumes of tar sands crude oil, so the EIR must consider the impact of such an increase.

1. Tar Sands Impacts

Tar sands oil deposits produce bitumen, "a dense and highly viscous petroleum found in clay and sand deposits known as bituminous sands, oil sands, or tar sands."[54] In spite of increasing bitumen production, "the scientific study of impacts has largely lagged behind the rapid pace of oil sands development, and where it has progressed, it has focused primarily on effects on regional landscapes, freshwater systems, climate change, and human communities. To date, the effects of the industry on marine environments have received relatively little scientific attention."[55] There is no publicly available information available on the behavior, fate, and toxicity of dilbit in the marine environment. These uncertainties are of great concern to

[52] *See Report: West Coast Tar Sands Invasion*, Natural Resources Defense Council et al., p. 4 (April 2015) (based on of a report by the Borealis Centre for Environmental and Trade Research, commissioned by NextGen and NRDC).
[53] *Comments of San Francisco Baykeeper, STAND.earth, and Friends of the Earth on the Phillips 66 Marine Permit Revision Project - Draft Environmental Impact Report*, August 28, 2017.
[54] Green et al., "Oil sands and the marine environment: current knowledge and future challenges," *The Ecological Society of America, Front Ecol. Environ.* 2017 (Green et al. 2017); 15(2): 74–83.
[55] *Id*.

Commenters, and any evaluation of the environmental impact of an increase in the shipping of bitumen to the Phillips 66 refinery must take this uncertainty into account by evaluating worst case scenarios and requiring robust mitigation measures based on precautionary principles.

Bitumen is chemically distinct from conventional oil and must be diluted to transport and refine. The diluted product is often referred to as "dilbit." Bitumen is generally considered to be a recalcitrant and immobile crude oil that requires unconventional extraction methods as well as the addition of diluents for transport through unheated transmission pipelines. "The key differences are in the exceptionally high density, viscosity, and adhesion properties of the bitumen component of the diluted bitumen that dictate environmental behavior as the crude oil is subjected to weathering (a term that refers to physical and chemical changes of spilled oil)."[56] There are many different formulas for the dilution of bitumen, most of which are considered trade secrets. "Diluted bitumen refers to many chemically distinct substances that vary in toxicity and chemical behavior from conventional oil (Crosby *et al*. 2013; Environment Canada 2013)."[57] Indeed, "sampling information for some blended bitumen products reveals high variability in chemical composition and physical properties," and precise information on chemical composition is considered a trade secret, effectively denying public access to vital safety information.[58]

There is very little publicly available information about the reaction of dilbit to the marine environment and the organisms and ecosystems found there, and widespread uncertainty remains even as to the most basic questions like whether dilbit products will float or sink, what chemicals are contained in dilbit at what concentrations, what response dilbit will have to weathering, and how it will interact with marine species and sediment.

> In cases where traditional removal or containment techniques are not immediately successful, the possibility of submerged and sunken oil increases. This situation is highly problematic for spill response because (1) there are few effective techniques for detection, containment, and recovery of oil that is submerged in the water column, and (2) available techniques for responding to oil that has sunk to the bottom have variable effectiveness depending on the spill conditions.[59]

Tar sands refining could increase drastically in California if existing pipeline and rail plans move forward. Tar sands industry expansion plans rely on California's refinery capacity. The Kinder Morgan Canada Initial Public Offering Prospectus indicated the company's reliance on California refining.[60] Phillips 66 has already attempted a series of projects to allow a switch to refining tar sands, what its management calls "advantaged crude." The company emphasizes "[the] opportunity that we have … is to get … Canadian crudes down into California … We're looking at rail to barge to ship, down to the West Coast refineries ...."[61] In May 2013, Phillips 66

[56] *Spills of Diluted Bitumen from Pipelines: A Comparative Study of Environmental Fate, Effects, and Response*, National Academies of Sciences (2016, National Academies Press).
[57] Green *et al*. 2017.
[58] *Id*.
[59] National Academies of Sciences 2016.
[60] Kinder Morgan Canada Limited, Preliminary Prospectus, Initial Public Offering, p. 23, 73 (April 24, 2017).
[61] September 12, 2013 Transcript, pdf p. 7, *available at*

Executive Vice President Tim Taylor stated in response to a question on bringing heavy Canadian crude oil into California: "Today, we are doing some barge movements down the coast into California on heavy Canadian. You can look in the Northwest to do that. So that's an option that we're going to continue to use and we're looking at expanding that opportunity with some of the logistics things we're putting in place."[62]

Each tanker trip carries an added risk of a spill, and Commenters are deeply concerned with the possibility that a tanker carrying tar sands crude to the Phillips 66 Marine Terminal will cause an oil spill. Marine cleanup of a tar sands spill has never been tried, and Commenters are deeply concerned with the potential ecological consequences of such a spill and responders' ability, or lack thereof, to effectively clean up a spill of tar sands dilbit.

The submergence of persistent residues of dilbit in aquatic environments, as was seen in the Kalamazoo River spill in Marshall, Michigan, and the potential for long-term deposition in sediments and banks and remobilization in the water column present environmental concerns and cleanup challenges not presented by commonly transported crude oils.

2. Environmental Impacts from Expanded Marine Terminal Operations

a. Water quality impacts

The water quality impacts from expanded use of the Phillips 66 marine terminal must be thoroughly examined. This includes the feedstocks transported over the marine terminal, either biofuels or petroleum products. Where tar sands are concerned, the EIR must examine impacts associated with the extraction of tar sands feedstocks in Canada to the dilution of those feedstocks with diluents and shipment by pipeline to Vancouver or other ports, through the loading process onto tankers and the shipping routes they take down the west coast to San Francisco Bay, then to the unloading of those feedstocks and transport into the refinery, the separation and reuse of diluents, the eventual shipment of refined or reused products to end markets or extraction sites, and finally through to impacts from the use of end products. This lifecycle analysis must take into account global effects such as climate change and ocean acidification, as well as local water quality impacts that could have serious consequences for the communities at extraction sites, ports, along the shipping routes, and near the actual Project site in Rodeo. This analysis must also disclose the extent to which unknowns exist, such as the lack of concrete information concerning effective marine spill cleanup methodologies for tar sands dilbit and any other feedstock (including plant- or animal-based feedstocks) and the environmental impacts of such spills, and evaluate the risks taken as a result of those unknowns. Such risk evaluation must take into account the massive harm done by dilbit in other places, such as Kalamazoo, and any known spills of biofuel feedstocks.

Each tanker trip carries an added risk of a spill, as a reported 50% of large spills occur in open water.[63] The majority of spills, however, are less than 200,000 gallons, and most of these

http://www.phillips66.com/EN/investor/presentations_ccalls/Documents/Barclays_091213_Final.pdf.

[62] May 31, 2013 Transcript, pdf p. 13, *available at* http://www.phillips66.com/EN/investor/presentations_ccalls/Documents/PSX-Transcript-2013-05-01.pdf.

[63] The International Tanker Owners Pollution Federation (2016 spill statistics), p. 8.

spills happen while in port.[64] Two types of tanker will likely be used at the Marine Terminal, coastal tankers, which can carry as much as 340,000 barrels of oil (14.3 million gallons), and coastal tank barges, which typically carry 50,000 to 185,000 barrels of oil, though newer models can carry as much as a coastal tanker. For reference, the tar sands spill in the Kalamazoo that cost over a billion dollars and still isn't cleaned up was 843,000 gallons of tar sands crude.[65] Even the smallest tar sands barge would carry at least twice that amount.

California's 45-billion-dollar coastal economy has a lot to lose to any kind of spill.[66] California commercial fisheries for instance, produced from 186-361 million pounds of fish from 2013-2015, at a value of 129-266 million dollars.[67] After the Costco Busan disaster spilled 53,000 gallons of oil into San Francisco Bay, the Governor closed the fishery, a significant portion of which was either contaminated or killed, closed more than 50 public beaches, some as far south as Pacifica, and thousands of birds died. All told that spill resulted in more than 73 million dollars in estimated damages and cleanup costs.[68] Imagine that times 267, the amount of oil carried by a fully laden coastal tanker, and instead of over a month to clean up, it could take as long as five years. An EIR evaluating the environmental impacts of expanding operations at the Phillips 66 Marine Terminal must take into account the increased risk of an unprecedented spill of tar sands crude oil, or any other type of feedstock or end product transported over the marine terminal at Phillips, into San Francisco Bay or at any other point along the route oil transport tankers and barges will take.

A recent spill at the Phillips 66 marine terminal serves as a warning of what could result from increased marine terminal operations. According to press reports, "BAAQMD issued two 'public nuisance' violations to Phillips 66 for its Sept. 20, 2016 spill, which leaked oil into the bay and sent an estimated 120 people to the hospital from fumes."[69] That spill, which occurred while the Yamuna Spirit was offloading at the Phillips 66 Marine Terminal in Rodeo, was responsible for more than 1,400 odor complaints and a shelter-in-place order for the 120,000 residents of Vallejo, in addition to the hospital visits already mentioned.[70] In light of these concerns, Contra Costa County must consider an independent study on spill (including tar sands) cleanup, the adequacy of existing cleanup procedures and the need for additional cleanup and restitution funds, and increased monitoring for water and air quality impacts to communities surrounding the Project, whether those communities are located in the same county or not.

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[64] *Id*.
[65] National Academies of Sciences 2016, p. 15.
[66] *California Ocean and Coastal Economies*, National Ocean Economics Program (March 2015).
[67] Based on California Department of Fish and Wildlife and National Marine Fisheries Service data.
[68] *See, e.g., Incident Specific Preparedness Review M/V Cosco Busan Oil Spill in San Francisco Bay Report on Initial Response Phase*, Baykeepr, OSPR, NOAA, et al. (Jan. 11, 2008).
[69] Katy St. Clair, "Supervisor Brown says 'no way' to proposed Phillips 66 expansion," Times-Herald (Aug. 5, 2017), *available at* http://www.timesheraldonline.com/article/NH/20170805/NEWS/170809877; *see also* Ted Goldberg, "Refinery, Tanker Firm Cited for Fumes That Sickened Scores in Vallejo," KQED News (June 16, 2017), *available at* https://ww2.kqed.org/news/2017/06/16/refinery-tanker-firm-cited-for-fumes-that-sickened-scores-in-vallejo/; Ted Goldberg, "Phillips 66 Seeks Huge Increase in Tanker Traffic to Rodeo Refinery," KQED News (July 27, 2017) *available at* https://ww2.kqed.org/news/2017/07/27/phillips-66-seeks-big-increase-in-tanker-traffic-to-rodeo-refinery/.
[70] Ted Goldberg, "Refinery, Tanker Firm Cited for Fumes That Sickened Scores in Vallejo," *id*.

Additional National Pollutant Discharge Elimination System (NPDES) effluent criteria may be needed, a possibility which must be evaluated in the proposed EIR. Foreseeable spill rates from an increase in marine terminal activity might qualify as a discharge to waters of the United States because it is reasonably predictable that a certain number of spills will occur. With this and other water quality impacts in mind, the regional water board should at least be a responsible agency. Furthermore, different feedstock may result in a change in the effluent discharged by the refinery under their existing NDPES permit, another reason why the regional water board should at least be a responsible party. The proposed EIR must evaluate an updated NPDES permit that reflects the changing feedstock that will result from the Project.

No reasonable mitigation or planning can be done with regard to the risk posed by the transport of feedstocks to the Phillips 66 refinery in Rodeo without specific information as to the chemical composition of the crude oil being transported. Details on the types of oil expected to arrive on the tankers utilizing the Marine Terminal's expanded capacity must be part of the EIR and must be made publicly available. For instance, it is irresponsible to base risk assessment and best practices for the handling of dilbit on assessments and practices for conventional oil without at least knowing exactly what the chemical composition of the dilbit is, including separate information on bitumen and diluent constituents, and how it differs from conventional oil. Likewise, biofuel feedstocks may behave differently when spilled than conventional petroleum products. As indicated above, the available scientific evidence suggests that the type of risks associated with different types of marine spills are wholly different depending on the type of substance spilled. Additional research into best management practices, spill prevention practices, and cleanup and response planning is needed before we can allow a major increase in the amount of tar sands or any other type of petroleum or biofuel feedstock coming into California's waters.

Commenters ask that the EIR contain and make publicly available an independent scientific study on the risks to – and best achievable protection of – state waters from spills of any substance carried to the Marine Terminal. The study should encompass potential spill impacts to natural resources, the public, occupational health and safety, and environmental health and safety. This analysis should include calculations of the economic and ecological impacts of a worst-case spill event in the San Francisco Bay ecosystem, along the California coast, and along the entire projected shipping route for the expanded marine terminal.

Based on this study, the EIR should also include a full review of the spill response capabilities and criteria for oil spill contingency plans and oil spill response organizations (OSROs) responsible for remediating spills. Commenters respectfully request that Contra Costa County include an analysis indicating whether there are OSROs currently operating in California capable of responding adequately to a spill of non-floating oil or any other substance proposed for shipment over the Phillips 66 marine terminal. Further, the adequacy of an OSROs spill response capability should be compared to the baseline of no action rather than to a best available control technology standard.

Additional ships delivering oil to the Project would be passing through a channel that the Army Corps of Engineers has slated for reduced dredging.[71] The Project thus contemplates

[71] Marathon Martinez, Letter to U.S. Coast Guard Sector San Francisco re: Pinole Shoal Channel Emergency Dredging, Sept. 25, 2020.

increasing ship traffic through a channel that could be insufficiently dredged. The EIR must evaluate the safety risks posed by reduced Pinole Shoal Navigation Channel Maintenance Dredging.[72] Should Contra Costa County require Phillips 66 to dredge the channel, it must fully evaluate and disclose impacts from such dredging in its environmental analysis.

Finally, the EIR must evaluate ship maintenance impacts. Increased shipping means increased maintenance in regional shipyards and at regional anchorages, and these impacts must be analyzed.

b. Wildlife impacts

Increased shipping causes stress to the marine environment and can thus impact wildlife. Wake generation, sediment re-suspension, noise pollution, animal-ship collisions (or ship strikes), and the introduction of non-indigenous species must all be studied as a part of the EIR process. "Wake generation by large commercial vessels has been associated with decreased species richness and abundance (Ronnberg 1975) given that wave forces can dislodge species, increase sediment re-suspension (Gabel et al. 2008), and impair foraging (Gabel et al. 2011)."[73] Wake generation must be evaluated as an environmental impact of the Project.

Acoustic impacts can also be extremely disruptive. "Increased tanker traffic threatens marine fish, invertebrate, and mammal populations by disrupting acoustic signaling used for a variety of processes, including foraging and habitat selection (e.g. Vasconcelos et al. 2007; Rolland et al. 2012), and by physical collision with ships – a large source of mortality for marine animals near the surface along shipping routes (Weir and Pierce 2013)."[74] Acoustic impacts must be evaluated as an environmental impact of the project.

Invasive species are also a dangerous side effect of commercial shipping. "Tankers also serve as a vector for the introduction of non-indigenous species (NIS) via inadvertent transfer of propagules from one port to another (Drake and Lodge 2004), with the probability of introduction depending on the magnitude and origin of shipping traffic along tanker routes (Table 1 and Figure 3; Lawrence and Cordell 2010)." Invasive species impacts must be evaluated as an environmental impact of the project.

c. Public Trust Impacts

The marine terminal occupies 16.7 acres of leased, filled and unfilled. This land is California-owned sovereign land in San Pablo Bay, and as a result the California State Lands Commission is a responsible party. Public trust impacts to this land and to other public trust resources must be evaluated in the EIR.

[72] Memorandum for Commander, South Pacific Division (CWSPD-PD), FY 17 O&M Dredging of San Francisco (SF) Bay Navigation Channels, U.S. Army Corps of Engineers (Jan. 12, 2017) (Army Corps memo discussing deferred dredging).
[73] Green *et al*. 2017.
[74] *Id*.

d. Shipping Traffic Impacts

Additional impacts must be analyzed starting at the port that ships take on their cargos and ending at the ports they discharge it to. The EIR should include shipping impacts to public or non-Project commercial vessels and businesses, including impacts to recreational boaters and ferries, that might experience increased delay, anchorage waits or related crowding, and navigational complexity. Such shipping traffic impact evaluations should extend to spills, air quality, marine life impacts from ship collisions, and other environmental impact evaluated by the EIR that could impact shipping traffic.

e. Air Quality Impacts

If there is a change in feedstocks as a result of the proposed Project's marine terminal increased usage, the EIR must evaluate any associated air quality impacts. The air quality baseline examined by the EIR cannot rely only on permitted levels.

The distinction in crude oil feedstock matters. The chemical composition of raw materials that are processed by a refinery directly affect the amount and composition of the refinery's emissions. The amount and composition of sulfur in the crude slate, for example, ultimately determines the amount of sulfur dioxide that will be emitted from every fired source in the refinery and the amount of odiferous hydrogen sulfide and mercaptans that will be emitted from tanks, pumps, valves, and fittings.

An increase from 59 ships per year to 135 ships per year carries with it obvious air quality impacts from ship exhaust, as well.[75] These impacts must be evaluated for every mile the ships travel, and for every community along their route. Ships will not arrive at the Project terminal from out of a vacuum, and each ship using the terminal – not just those currently permitted – must be evaluated.

Phillips 66 does not have a good record of avoiding air quality violations at its Rodeo refinery. In 2016, BAAQMD settled for nearly $800,000 with Phillips 66 for 87 air quality violations between 2010 and 2014.[76] Such past violations must be evaluated when considering the likelihood of future violations that may relate to a change in feedstock or increased refinery activity as a result of the marine terminal expansion.

[75] Phillips 66 is claiming essentially the same need in its current request that it claimed in its request to BAAQMD in 2017, *i.e.*, that it needs the marine terminal expansion because the Santa Maria facility is going to shut down. Therefore, it is reasonable to conclude that shipping numbers and other impacts will be similar. See BAAQMD, Engineering Division, Notice of Preparation and Notice of Public Scoping Meeting, Phillips 66 Marine Terminal Permit Revision Project - Draft Environmental Impact Report (June 14, 2017). Regardless, the EIR must contain the actual numbers of ships Phillips 66 intends to bring to its terminal as a part of the project.

[76] "Air District settles case with Phillips 66," BAAQMD Press Release (August 3, 2016), *available at* http://www.baaqmd.gov/~/media/files/communications-and-outreach/publications/news-releases/2016/settle_160803_phillips-pdf.pdf?la=en.

F. Process Safety Risks and Other Process Impacts

The EIR must consider and explore the fact that processing vegetable or animal-derived biofuel feedstocks in a hydrotreater or hydrocracker creates significant process upset risks beyond those that attend crude oil refining. The upset risk is increased because the extra hydrogen that must be added to convert the new feedstock to hydrocarbon fuels generates more heat in process reactions that occur under high pressure and are prone to runaway reactions. The reaction is exothermic: it generates heat. When it creates more heat, the reaction can feed on itself, creating more heat even faster.[77]

The reason for the increased heat, and hence risk, is that the removal of oxygen from fatty acids in the biofuel feed, and saturating the carbon atoms in that feed to remove that oxygen without creating unwanted carbon byproducts that cannot be made into biodiesel and foul the process catalyst, require bonding that oxygen and carbon with a lot more hydrogen. The project would use roughly ten times as much hydrogen per barrel biorefinery feed than petroleum refining needs from hydrogen plants per barrel crude.[78] Reacting more hydrogen over the catalyst in the hydrotreating or hydrocracking reactor generates more heat faster. This is a well-known hazard in petroleum processing, that manifests frequently in flaring hazards[79] when the contents of high-pressure reactor vessels must be dumped to flares in order to avoid worse consequences that can and sometimes have included destruction of process catalyst or equipment, dumping gases to the air from pressure relief valves, fires and explosions. The extra hydrogen reactants in processing the new feedstocks increase these risks. On top of that, this severe processing environment can be highly corrosive, leading to frequent or even catastrophic equipment failures. Contaminants and processing byproducts of the new feeds could create new damage mechanism hazards.

There are measures to control the reaction heat, pressure – including through process design and operation measures such as quenching between catalyst beds in the reactor and careful control of how hot the reactor components get, how much hydrogen is added, how much feed is added, and how long the materials remain in the reactor, preventing hot spots from forming inside of it, and intensive monitoring for equipment damage and catalyst fouling. While these measures should be considered in the EIR as mitigation, we note that they are imperfect at best, and rely on both detailed understanding of complex process chemistry and monitoring of

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[77] Robinson and Dolbear, "Commercial Hydrotreating and Hydrocracking. *In* Hydroprocessing of heavy oils and residua," 2007. Ancheyta and Speight, eds. CRC Press, Taylor and Francis Group: Boca Raton, FL, pp. 308, 309.

[78] Huo et al., "Life-Cycle Assessment of Energy and Greenhouse Gas Effects of Soybean-derived Biodiesel and Renewable Fuels," Argonne National Laboratory 2008 (Huo et al. 2008) estimated HEFA processing of soybean oil targeting drop-in biodiesel fuel uses 0.03–0.32 pounds of hydrogen per pound of final fuel product. That converts to roughly 2,000–2.200 cubic feet of hydrogen per barrel of soy oil feed (at 89.9 g/m^3 H_2 and a soy oil specific gravity of 0.916). Karras 2010 compiled federally reported operating data from U.S. petroleum refineries from 1999–2008 showing that nationwide petroleum refinery usage of hydrogen production plant capacity averaged 272 cubic feet of H_2 per barrel crude processed. *See* Table 2-3., "NREL-Simulated Renewable Fuels Mass and Energy Balances" in Huo et al., 2008. Life-Cycle Assessment of Energy and Greenhouse Gas Effects of Soybean-Derived BIodiesel and Renewable Fuels. ANL/ES/08-2. U.S. Department of Energy, Argonne National Labaratory: Argonne, Il. See also G. Karras, "Combustion Emissions from Refining Lower Quality Oil: What is the Global Warming Potential?" *Env. Sci. Technol.* 44: 9584–9589 (2010) DOI:10.1021/es1019965 (Karras 2010) at Table S1.

[79] *See* flaring causal analyses pursuant to Bay Area Air Quality Management District Regulation 12, Rule 12: https://www.baaqmd.gov/about-air-quality/research-and-data/flare-data/flare-causal-reports.

conditions in multiple parts of the process environment. Both those conditions are difficult to attain in current petroleum processing, and even more difficult with new feedstocks with which there is less current knowledge about the complex reactions and how to monitor them when the operator cannot "see" into the reactor very well during actual operation; and cannot meet production objectives if production is repeatedly shut down in order to do so.

Since the Project's new feedstock and process system are thus known to worsen the underlying conditions that can become (and have become) root causes of hazardous incidents, the EIR must thoroughly evaluate and mitigate these risks. The EIR must evaluate, *inter alia,* the impact of the proposed new feedstock and production process on worker safety, community safety, and upset frequency and impacts (including increased flaring). In this regard, the EIR analysis should ascertain whether Phillips 66 intends to decommission any part of its flaring infrastructure at the Rodeo refinery.

G. Site Decommissioning Impacts

Phillips 66 proposes decommissioning the Santa Maria facility – and, as discussed above, would likely do so regardless of whether or not the Project is approved. It is thus essential that the EIR evaluate the impact of such decommissioning, and address possible mitigation of its impacts on workers, the surrounding community, and the environment.

Specifically, the EIR should consider the possibility of requiring that the Santa Maria facility be decommissioned gradually rather than abruptly, to avoid unnecessarily unjust transitions for Santa Maria facility workers and nearby communities. A gradual decommissioning of this nature would also mitigate or eliminate the need for increased crude oil throughput over the Rodeo marine terminal, which the Application proposes to replace the Santa Maria facility output.[80] It could also reduce the severity of environmental impacts associated with the proposed increase in oil imports through S.F. Bay. The EIR should fully evaluate the extent to which it is feasible to lessen or avoid the impacts by decommissioning the Santa Maria facility.

Additionally, while the Application is ambiguous on this point, it is clear that a substantial portion of currently operative crude oil refining equipment at the Rodeo facility will be idled as part of the Project. The idled equipment includes the carbon plant and the coking and crude distillation units, and likely includes the U230 De-Hex unit, U228 C5/C6 Isom unit, the U229 and U230 naphtha hydrotreaters, the U231 and U244 catalytic naphtha reformers, various unnamed petroleum storage tanks, furnaces, boilers, heaters, fractionators, heat exchangers, cooling towers, process fluids piping and more.[81] This equipment, and the ground on which it is located, is likely to be highly contaminated from years of operation of the refinery.

[80] Application at 12.

[81] This preliminary, incomplete list is based in part on comparison of current equipment shown in Figure 5 of the Application with the project configuration shown in Figure 6 of the Application. Note that figures 5 and 6 in the Application do not depict all existing equipment units and may not depict some equipment units to be repurposed.

Various oil companies refined oil at the Rodeo site since 1896,[82] some 75 years before the environmental protection wave of the early 1970s, and through waves of toxic gasoline additives—tetraethyl lead and then MTBE, from the 1930s through the early 2000s—and refinery releases to land persist to this day. Today, evidence that refinery byproduct waste disposal continues on surrounding land is here for all to see, at the carbon plant, where toxics-laden petroleum coke particulates dust the surrounding soil.

Phillips 66 should be made to specify, for inclusion in the EIR analysis, what it plans to do with such equipment, and how it will address site contamination in fallowed portions of the refinery. The need for such analysis is particularly acute given that the Diesel Free by 33 pledge that County has signed suggests a limited commercial lifetime for biofuels production.

VI. The EIR Should Consider Project Alternatives That Would Minimize Impacts

At the heart of CEQA analysis is a discussion of available project alternatives. CEQA provides that "[t]he purpose of an environmental impact report is to identify the significant effects of a project on the environment, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided." It further provides that "The purpose of an environmental impact report is ... to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project." *Laurel Heights Improvement Assn. v. Regents of University of California*, 47 Cal.3d 376 (1988), citing Public Resources Code §§ 21002.1(a), 21061.

Accordingly, it will be essential for the EIR to evaluate an array of alternatives that minimize the environmental impacts of the Project, as well as mitigating any impacts that remain. Below is a discussion of three specific Project alternatives that the EIR should consider.

A. No Increased Throughput Over the Marine Terminal

The EIR should consider an alternative in which throughput over the marine terminal is not increased as proposed in the Application, or is increased less than the amount requested. The Application presents no rational need for the proposed throughput increase; indeed, the limited reasoning provided in support of it makes very little sense. Eliminating the increased throughput over the marine terminal would minimize the transportation-related potential impacts, including oil spill risk, described above.

The Application asserts that the increase in crude oil coming in over the Rodeo terminal is necessary "to accommodate the idling and decommissioning of the Santa Maria facility in San Luis Obispo County ... [and] seeks to ensure a reliable crude supply on an interim basis—until the renewable Project is fully operational—to maintain current production levels."[83] The County similarly states this oil imports increase over the terminal is to "replace the current crude oil

[82] *California Refinery History;* California Energy Commission: Sacramento, CA. https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/californias-oil-refineries/california-oil.
[83] Application at 12.

feedstocks during construction, when the Santa Maria facility's output is no longer available... ."[84]

However, this explanation makes no sense given that refining equipment cannot maintain production when it is offline for construction. The project to convert the Rodeo refinery from a crude refining facility to a biofuels refining facility includes a massive construction project that will require shutdown of production equipment until the construction is complete – precluding the possibility of maintaining crude oil throughput during that time. Converting oil refinery hydrotreating and hydrocracking units to make "drop-in" biofuels from vegetable oils and animal fats safely and efficiently would require, among other things, physical changes to equipment and process materials in those units, requiring full shutdown of those units. As P66 proposes to convert all its hydrocracking capacity and most of its hydrotreating capacity[85] to 100% drop-in biofuels refining of vegetable oil/animal fat feeds, its Rodeo facility cannot "maintain current production levels" during project construction. It would refine less oil, not more, during project construction.

We note that the Rodeo plant has no catalytic cracking unit.[86] Hence, its hydrocracking capacity is essential to converting gas oils (from its distillation units, its coker, the Santa Maria facility, and imports over its terminal) into engine fuels. While the hydrocrackers are offline for project construction, the refinery could still make naphtha and distillates from those sources into gasoline, diesel, and jet fuel, but at reduced volumes compared with production during normal operation. And with its diesel and jet fuel hydrotreaters offline for construction as well, production volumes of those fuels would be lower still.

In any event, as discussed in subsection C below, even to the extent it may be possible for Phillips 66 to continue processing crude oil during the Project construction process (which seems unlikely), the Rodeo facility could continue to receive crude from the Santa Maria facility if the closure of the latter facility is done in a more appropriately gradual manner. Phillips 66 has provided no reason why the Santa Maria refinery needs to be closed abruptly and immediately (although there is the distinct possibility, discussed in subsection IV, *supra*, that they have decided on the closure separate and apart from the Project).

Accordingly, the EIR should consider an alternative that minimizes or eliminates the proposed increase in imports over the Rodeo terminal. Phillips 66 should be asked to disclose construction downtime schedules for each hydrotreater and hydrocracker to be converted as part of an assessment of how much less crude oil would be refined during project construction. We note, in addition, that if Phillips 66 plans little or no downtime of these units because it plans few or no changes to them, that would raise even more serious concerns about process safety hazards that should be evaluated in the EIR.

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[84] NOP at 3.

[85] In its Application Phillips 66 identifies Hydrocracking Unit 240 (U240), Hydrocracking Unit 246 (U246), and hydrotreating units 248 (U448) and 250 (U250) as existing refinery equipment (*see* pages 5, 6), and lists these process units by number in figures 5 and 6. Figure 5 further depicts these units as existing equipment. Figure 6, entitled "Rodeo Facility Post Rodeo Renewed Project Block Flow Diagram" identifies each of these four process units as "Renewable Fuels" project equipment. These four process units would be converted to biofuel feeds.

[86] Application at 4–9 and Figure 5. No catalytic cracking process unit is listed or shown, as none exists at Rodeo.

B. Use of Renewable-Powered Electrolysis to Produce Hydrogen from Water

The Project would repurpose and use the U-110 and U-120 hydrogen plants at the Rodeo facility for its biofuels production process.[87] These are fossil fuel hydrogen production plants that use steam reforming to strip hydrogen from hydrocarbon feeds at extremely high reaction temperatures, and are fed and fueled by purchased natural gas and hydrocarbon byproducts of refining processes at the facility. This steam reforming process is extremely carbon-intensive, emitting roughly nine times more CO_2e than its hydrogen output by weight. That high carbon intensity is compounded by the project's use of a hydro-conversion technology (HEFA), which requires several times more hydrogen per barrel of biofuel feed than petroleum refining requires from on-purpose hydrogen production per barrel of crude.[88] This choice of technology could make hydrogen production the predominant source of direct CO_2e emission from the biofuel refinery, and boost the carbon intensity of biofuels produced substantially.

At least one commercialized technology, electrolysis, can supply zero-emission hydrogen using renewable electricity. Producing hydrogen by electrolysis is a proven technology. It has been used commercially in other sectors and reportedly was commercialized before fossil fuel steam reforming was used to produce hydrogen for oil refining. Coupling electrolysis with renewable electricity to produce hydrogen from water, often called "green" hydrogen but more transparently labeled "renewable-powered electrolysis" hydrogen, is a zero-emission alternative to the carbon-intensive hydrogen production the Project proposes to repurpose and use for biofuel refining. Energy sector projects are underway elsewhere to build renewable-powered electrolysis plants now.[89] Renewable-powered electrolysis could replace the most carbon-intensive biofuel refining process step proposed by the project in Rodeo. The EIR should therefore include use of renewable-powered electrolysis as an alternative to minimize Project impacts.

Using this proven alternative for biofuel refining would eliminate the vast majority of direct CO_2e emissions from project biofuel refining, cut the carbon-intensity of combustion fuels the project would produce significantly, and lessen or avoid other project impacts that appear likely to be significant if the project proceeds as proposed.

Crucially as well, Phillips 66 would not be locked into prolonged biofuel refining as lower carbon hydrogen-fueled freight and shipping expands per state policy, because it could shift the zero-emission hydrogen asset to fueling that cleaner transportation expansion. Solar and wind energy storage in the hydrogen produced at Rodeo, then stored in those vehicles, would further support state renewable goals.

We note, briefly, some additional factors the County should consider as it evaluates this proven zero-emission alternative in the EIR. First, Phillips 66 appears to have ample room to

[87] Application at 4, 9, and Figure 6.
[88] The project could require roughly ten times as much on-purpose hydrogen to be produced per barrel of refinery vegetable oil feedstock as crude refining, as noted in subsection V. F. above—approximately 2,000 cubic feet per barrel or more running soy oil, as compared with 272 cubic feet per barrel running the average crude refined nationwide from 1999-2008.
[89] K. Adler, "Europe Emerges as Leader in Hydrogen Economy. IHS Markit," December 15, 2020 (Adler 2020) *available at* https://ihsmarkit.com/research-analysis/europe-emerges-as-leader-in-hydrogen-economy.html.

build it within the Rodeo site.[90] Second, scheduled project construction could offer the simplest, cheapest, and most environmentally effective time to install this climate-safe alternative.[91] Third, as the project could be supported by enormous public investment,[92] and the hydrogen in hydrocarbon fuels it produces would be renewable with this alternative,[93] the value and "renewable" energy purpose of this potential public investment must be weighed in assessing the economic sustainability of the project with and without this alternative. Fourth, the extent to which solar and wind power prices could continue to fall relative to those of fossil fuels[94] should be considered in evaluating the economics of renewable-powered electrolysis hydrogen over the time when the project could operate, and partially switch to hydrogen vehicle fueling. Lastly, noting again that crucial pivot from biofuels combustion to decarbonized electrification of transportation which zero-emission hydrogen here could support, its ability to avoid potentially enormous cumulative future health costs must be considered in evaluating this alternative.[95]

For all of these reasons, public review of the project will demand a pivotal choice between fossil fuel and renewable hydrogen-based fuel production. This choice could be locked in beyond the duration of project operation. As it involves the largest biofuel refining project contemplated anywhere, this choice likely will set precedents for future biofuel projects. Robust evaluation of the hydrogen alternative—renewable-powered electrolysis—will be essential to accurate environmental review of the project.

C. Alternatives that Minimize Decommissioning Impacts

As discussed above, the County should consider the possibility of a gradual phased decommissioning of the Santa Maria refinery. An alternative of this nature would not only minimize or eliminate the need for increased crude oil imports over the terminal, but would minimize the disruption to workers and the surrounding community, and better allow for a just transition to a different economy and tax base.

In addition, as also discussed above, the County should consider an alternative that requires cleanup and remediation of all fallowed portions of both the Santa Maria and Rodeo

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[90] See site maps given in the NOP and Application. The County should compare electrolysis footprints elsewhere with on-site project alternative plant siting options.

[91] "It is simpler, less expensive, and more effective to introduce inherently safer features during the design process of a facility rather than after the process is already operating." CSB, 2013, *Interim Investigation Report, Chevron Richmond Refinery Fire* at page 40. U.S. Chemical Safety Board: Washington, D.C. https://www.csb.gov/file.aspx?Documentid=5913.

[92] State LCFS, federal RIN credits and federal tax breaks to "renewable" diesel fuel projects are reported to reach $3.30 per gallon. *See* Tepperman, J., *Refineries Renewed;* East Bay Express, September 16, 2020, *available at* https://www.eastbayexpress.com/oakland/refineries-renewed/Content?oid=30619701. At its full 67,000 b/d (2.81 million gallons/day) capacity, $3.30/gallon is $3.4 billion annually.

[93] Hydrogen would be the most abundant element in the fuels that the project could produce.

[94] Adler 2020.

[95] In fact Zhao and colleagues found that even "[a]fter subtracting the cost [of renewable electric alternatives to biofuels], the net monetized benefit of the electrification-focused pathway still exceeds that of the renewable fuel-focused pathway, indicating that a cleaner but more expensive decarbonization pathway may be more preferable in California." Zhao et al., "Air Quality and Health Cobenefits of Different Deep Decarbonization Pathways in California" (2019). *Env. Sci. Technol.* 53:7163–7171. DOI: 10.1021/acs.est.9b02385 (Zhao 2019).

refineries, to minimize the risk that either refinery community will be left with a contaminated and unusable site in its midst.

VII. Conclusion

For all of the reasons explained herein, it is essential that the EIR set forth a thoroughgoing discussion of all potential impacts of the Project, as well as an accurate baseline against which to measure those impacts. We remain available at the emails listed below to discuss our concerns and recommendations with County staff.

Thank you for consideration of these comments.

Very truly yours,

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