BEFORE THE ADMINISTRATOR
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

In the matter of:

Alon USA – Bakersfield Refinery Crude Oil Flexibility Project
Project # S-1134224 & S-1134223
Proposed Authority to Construct / Certificate of Conformity

Issued by the San Joaquin Valley Air Pollution Control District

---

PETITION TO OBJECT TO ISSUANCE OF AUTHORITY TO CONSTRUCT / CERTIFICATE OF CONFORMITY FOR THE ALON BAKERSFIELD CRUDE OIL FLEXIBLITY PROJECT

Pursuant to section 505 of the Clean Air Act, 42 U.S.C. § 7661d(b)(2), 40 C.F.R. §§ 70.7 and 70.8(d), and San Joaquin Valley Air Pollution Control District ("Air District") Rule 2201, Association of Irritated Residents, Center for Biological Diversity, and the Sierra Club hereby petition the Administrator of the U.S. Environmental Protection Agency ("Administrator" or EPA) to object to the San Joaquin Valley Air Pollution Control District's proposed issuance of an Authority to Construct / Certificate of Conformity (the "Permit") for the Alon USA – Bakersfield Refinery Crude Oil Flexibility Project, Facility # S-33 & S-3303, Project # S-1134224 & S-1134223.

The Administrator must object to the Permit because it (1) fails to consider and apply Best Available Control Technology; (2) fails to properly calculate the emissions increase that must be offset because it relies on an improper emissions baseline; (3) severely underestimates the Project's emissions of volatile organic compounds by relying on flawed assumptions about the crude oils that will be stored and processed at the Refinery; (4) improperly exempts from emissions offset requirements existing heaters that will be retrofitted; and (5) relies on invalid emissions reduction credits for all other emissions increases.

INTRODUCTION

The Alon Bakersfield Crude Oil Flexibility Project (the "Project") entails a five-fold increase in the Alon Bakersfield Refinery's ("Refinery") capacity to import crude oil from 40 tank cars per day to 208 tank cars per day, or up to 63.1 million barrels of crude per year (over 173,000 barrels per day). As a result of this Project, millions of barrels of volatile Bakken crude oils will be hauled through California's most sensitive areas and treacherous passages, ultimately ending up in our most pollution-burdened communities for intensive refining. This influx of cheap, mid-continent crudes, including Bakken crude from North Dakota and Canadian tar sands, will allow the shuttered Refinery to reopen and run at full capacity, processing 70,000 barrels of crude oil per day. Restarting the Refinery—which has been mostly idle since 2008—will significantly increase harmful air pollution that will only exacerbate the poor air quality and respiratory illnesses that plague San Joaquin Valley communities already unfairly burdened with industrial pollution. Further, the massive ramp-up in crude imports will significantly increase greenhouse gas emissions and the risk of catastrophic accidents and oil spills along the rail transport route.

Unfortunately, the Air District's preliminary decision on the Authority to Construct does not meet New Source Review requirements under District Rule 2201. It fails to consider and apply Best Available Control Technology ("BACT") to the Project's new emissions units or those units undergoing major modifications, including new and modified floating roof tanks, new boilers, and new pumps and compressors. These units are expected to emit significant levels of oxides of nitrogen ("NOx") and volatile organic compounds ("VOC"), which result in the formation of ozone, for which the Valley is already in "extreme" nonattainment. Given existing unhealthy air quality that already exacts an enormous toll on Valley residents in the form of chronic respiratory illnesses, emergency room visits, premature death, missed school days, medical bills, lost wages, and reduced worker productivity, the application of BACT to these new and modified units is imperative.

The emissions offsets analysis for the proposed Authority to Construct is also improper. The analysis fails to properly calculate the emissions increase that must be offset because it erroneously relies on a 2008 baseline that does not represent normal non-operational conditions at the Refinery. In addition, it severely underestimates the Project's VOC emissions by relying on flawed assumptions about the crude oils that will be stored and processed at the Refinery. The analysis also improperly exempts from emissions offset requirements existing heaters that will be retrofitted and relies on invalid emissions reduction credits ("ERCs") for all other emissions increases. The failure to properly offset the Project's emissions increases will only result in further deterioration of the Valley's air and put attainment of air quality standards further out of reach.

PETITIONERS

Petitioner Association of Irritated Residents ("AIR") is a California non-profit corporation based in Kern County. AIR formed in 2001 to advocate for clean air and environmental justice in San Joaquin Valley communities. AIR has several dozen members who reside in Kern, Tulare, Kings, Fresno, and Stanislaus Counties. AIR members through themselves, their families, and friends, have direct experience with the many health impacts that arise from the type of pollution emissions associated with this Project.

Petitioner Center for Biological Diversity (the "Center") is a non-profit corporation with offices in San Francisco, Los Angeles, and elsewhere throughout California and the United States. The Center is actively involved in environmental protection issues throughout California and North America and has over 50,000 members, including many throughout California and in Kern County. The Center's mission includes protecting and restoring habitat and populations of imperiled species, reducing greenhouse gas pollution to preserve a safe climate, and protecting air quality, water quality, and public health. The Center's members and staff include individuals who regularly use and intend to continue to use the areas in Kern County and elsewhere affected by the Project's refinery operations and rail transportation activities, including members who are particularly interested in protecting the many native, imperiled, and sensitive species and their habitats that may be affected by the Project.

Sierra Club is a national nonprofit organization of approximately 600,000 members. Sierra Club is dedicated to exploring, enjoying, and protecting the wild places of the earth; to practicing and promoting the responsible use of the earth's ecosystems and resources; to educating and encouraging humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. Sierra Club's particular interest in this case and the issues which the case concerns stem from Sierra Club's interests in reducing reliance on fossil fuels and protecting the health of vulnerable communities. Sierra Club has approximately 600 members in Kern County and many more along the crude-by-rail transport route for this Project. These members live, work, and recreate in counties that are affected by the proposed crude-by-rail and Refinery operations.

PROCEDURAL BACKGROUND

On October 25, 2013, Alon USA Energy Inc. ("Alon") applied to the Air District for an Authority to Construct permit and Certificate of Conformity to modify its Bakersfield refinery and expand the refinery's crude rail terminal. The Air District published notice of its preliminary decision on the project on October 14, 2014, triggering a 30-day comment period on the preliminary decision. Public comments were due on November 19, 2014. *See* Authority to Construct Application Review, PDF 1 (Exhibit 1). The Air District e-mailed the preliminary decision to EPA on October 14, 2014, triggering a 45-day review period by EPA, ending on November 28, 2014. *See* Authority to Construct Application Review, PDF 1 (Exhibit 1). EPA did not object to the issuance of the Permit or otherwise submit comments.

This petition is timely because it is filed within sixty days of the expiration of EPA's 45-day review period, as required by section 505(b)(2) of the Clean Air Act, 42 U.S.C. § 7661d(b)(2) and Air District Rule 2201 § 5.9.1.7. The Administrator must grant or deny this petition within sixty days after it is filed. *See id.* In compliance with section 505(b)(2) of the Clean Air Act, 42 U.S.C. § 7661d(b)(2), and Air District Rule 2201 §5.9.1.7, this petition is based on objections that were raised during the public comment period. Petitioners' comment letter is attached as Exhibit 2.

GROUNDS FOR OBJECTIONS

Petitioners request that the Administrator object to the Permit because it does not comply with 40 C.F.R. Part 70 and Air District Rule 2201. In particular, it (1) fails to consider and apply BACT to the Project's new emissions units or those units undergoing major modifications, including new and modified floating roof tanks, new boilers, and new pumps and compressors; (2) fails to properly calculate the emissions increase that must be offset because it erroneously relies on a 2008 baseline that does not represent normal non-operational conditions at the Refinery; (3) severely underestimates the Project's VOC emissions, by relying on flawed assumptions about the crude oils that will be stored and processed at the Refinery; (4) improperly exempts from emissions offset requirements existing heaters that will be retrofitted; and (5) relies on invalid emissions reduction credits for all other emissions increases.

I. The Authority to Construct Fails to Apply BACT.

The proposed Permit fails to apply BACT to new floating roof tanks, boilers, and compressors and pumps, despite the District's determination that BACT is triggered for each of these units. BACT is "the most stringent emission limitation or control technique of the following": "[a]chieved in practice for such category and class of source;" "[c]ontained in any State Implementation Plan approved by the Environmental Protection Agency for such category and class of source"; "[c]ontained in an applicable federal New Source Performance Standard"; or "[a]ny other emission limitation or control technique, including process and equipment changes of basic or control equipment, found by the APCO to be cost effective and technologically feasible for such class or category of sources or for a specific source." Rule 2201 § 3.10. Generally, BACT is required for new or modified emissions units that result in emissions exceeding certain thresholds. *See generally* Rule 2201 § 4.0. Because the Permit fails to apply BACT, the Administrator must object to the Permit.

A. Stricter Volatile Organic Compound Control Systems and Geodesic Domes Must Be Applied to the Floating Roof Tanks.

The Authority to Construct does not apply BACT on floating roof tanks that store volatile substances, such as Bakken crude. The new tanks' VOC emissions will be subject to "95% control of VOC emissions, through use of primary metal shoe seal with secondary wiper, or equivalent." Authority to Construct Application Review, Crude Oil Flexibility Project ("Application Review"), PDF 38 (Exhibit 1). The Bay Area Air Quality Management District ("BAAQMD"), however, has determined that a "[v]apor recovery system w/ an overall system efficiency > ***98%***" is "technologically feasible" and "cost effective."[1] (emphasis added).

The Authority to Construct also fails to require geodesic domes to reduce VOC emissions from floating roof tanks. These domes on floating roof tanks are feasible, satisfy best available control technology, and are widely used. The BAAQMD BACT Guidelines specify that "a dome is required for tanks that meet all of the following: 1) capacity greater than or equal to 19,815 gallons [approximately 629 barrels] 2) located at a facility with greater than 20 tpy VOC emissions since the year 2000 and 3) storing a material with a vapor pressure equal to or greater than 3 psia (except for crude oil tanks that are permitted to contain more than 97% by volume crude oil)." Ex. A. The 250,000-barrel external floating roof tanks are 397 times the volume of the BAAQMD threshold and will certainly exceed a vapor pressure of 3psia when storing light crude oils, such as Bakken, Eagle Ford, and Permian Basin crude oils.

---

[1] The BAAQMD BACT Guidelines are available at http://hank.baaqmd.gov/pmt/bactworkbook/. Relevant portions are attached as Exhibit A.

Over 10,000 aluminum domes have been installed on petrochemical storage tanks in the United States.[2] For example, at the ExxonMobil Torrance Refinery, the refinery

> completed the process of covering all floating roof tanks with geodesic domes to reduce volatile organic compound (VOCs) emissions from facility storage tanks in 2008. By installing domes on our storage tanks, we've reduced our VOC emissions from these tanks by 80 percent. These domes, installed on tanks that are used to store gasoline and other similar petroleum-derived materials, help reduce VOC emissions by blocking much of the wind that constantly flows across the tank roofs, thus decreasing evaporation from these tanks.[3]

A similar project to increase crude storage capacity, recently proposed at the Phillips 66 Los Angeles Carson Refinery, required external floating roof tanks with geodesic domes to store crude oil with an RVP of 11.[4] The Negative Declaration for this project assumed these tanks would store crude oil with a TVP <11 psi.[5] The RVP would be even higher. The ConocoPhillips Wilmington Refinery added a geodesic dome to an existing oil storage tank to satisfy BACT.[6] Similarly, Chevron proposed[7] to use domes on several existing tanks to mitigate VOC emission increases at its Richmond Refinery.[8] The U.S. Department of Justice CITGO Consent Decree

---

[2] M. Doxey and M. Trinidad, Aluminum Geodesic Dome Roof for Both New and Tank Retrofit Projects, Materials Forum, v. 30, 2006, available at: http://www.materialsaustralia.com.au/lib/pdf/Mats.%20Forum%20page%20164_169.pdf (Exhibit B).

[3] Torrance Refinery: An Overview of our Environmental and Social Programs, 2010, available at: http://www.exxonmobil.com/NA-English/Files/About_Where_Ref_TorranceReport.pdf (Exhibit C).

[4] See, e.g., Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Capacity Project, September 6, 2013, Table 1-1, Draft Negative Declaration, available at http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2014/draftnd-p66storage.pdf (Exhibit D).

[5] *Ibid.*

[6] SCAQMD Letter to G. Rios, December 4, 2009, available at: http://yosemite.epa.gov/r9/air/epss.nsf/e0c49a10c792e06f8825657e007654a3/e97e6a905737c9bd882576cd0064b56a/$FILE/ATTTOA6X.pdf/ID%20800363%20ConocoPhillips%20Wilmington%20-%20EPA%20Cover%20Letter%20%20-AN%20501727%20501735%20457557.pdf (Exhibit E).

[7] City of Richmond, Chevron Refinery Modernization Project, Environmental Impact Report, Volume 1: Draft EIR, March 2014 (Chevron DEIR), available at: http://chevronmodernization.com/project-documents/.

[8] Chevron DEIR, Chapter 4.3, available at: http://chevronmodernization.com/wp-content/uploads/2014/03/4.3_Air-Quality.pdf (Exhibit F).

required a geodesic dome on a gasoline storage tank at the Lamont, Texas refinery.[9] Further, numerous vendors have provided geodesic domes for refinery tanks.[10]

These numerous applications of geodesic domes to control VOC emissions from refinery storage tanks satisfy the "achieved in practice" test for BACT. Thus, geodesic domes must be required to satisfy BACT for the new and modified storage tanks under SJVAPCD Rule 2201.

Finally, because VOC emissions have been severely underestimated, *see* section III below, the potential amount of emissions to be reduced by the above VOC-controls is much greater than what the District's initial emissions estimates might indicate, and must be included when determining BACT. Because the Permit fails to comply with BACT requirements for the storage tanks, the Administrator must object to the Permit.

B. The BACT Analysis for the New Boilers Is Incomplete.

The BACT analysis for the three new boilers is flawed, failing to demonstrate that NOx, carbon monoxide ("CO"), and hydrogen sulfide emissions will be reduced to the extent feasible.

1. *NOx Selective Catalytic Reduction*

With respect to the boilers' NOx emissions, the District's Application Review concludes that 6 ppmv at 3% O2 using low-NOx burners is BACT. The top-down BACT analysis, however, rules out the application of selective catalytic reduction ("SCR") (which would achieve 5 ppmv NOx at 3% O2), because the cost of reducing emissions using this technology does not meet the District's cost-effectiveness threshold of $24,500 per ton. Application Review, PDF 478-79. The District's calculations show that the cost-effectiveness is only $58,198 per ton. *Ibid.* These calculations, however, do not explain or justify the underlying assumptions, precluding a meaningful assessment of the cost-effectiveness analysis. For example, the calculations state that an equipment life of 10 years is assumed. But in Alon's original application and BACT analysis for the project, Alon assumed a 20-year equipment life. *See* Ex. J. Indeed, the "capital recovery factor"($i[1+i]^n/[1+i]^n-1$) used in Alon's analysis is much lower (0.0944) than the one used by the District (0.1627). EPA's Air Pollution Control Cost Manual also provides an example calculation of SCR cost-effectiveness using a 20-year equipment life and 7% interest rate,

---

[9] CITGO Petroleum Corp. Clean Air Act Settlement, available at: http://www2.epa.gov/enforcement/citgo-petroleum-corporation-clean-air-act-settlement (Exhibit G).

[10] See, e.g., Aluminum Geodesic Dome, available at: http://tankaluminumcover.com/Aluminum-Geodesic-Dome; Larco Storage Tank Equipments, available at: http://www.larco.fr/aluminum_domes.html; Vacono Dome, available at: http://www.easyfairs.com/uploads/tx_ef/VACONODOME_2014.pdf; Peksay Ltd., available at: http://www.peksay.info/oil_terminals/geodesic_domes.htm; United Industries Group, Inc., available at: http://www.thomasnet.com/productsearch/item/10039789-13068-1008-1008/united-industries-group-inc/geodesic-aluminum-dome-roofs/ (Exhibit H).

resulting in a cost recovery factor of 0.0944.[11] Using this lower capital recovery factor in the District's calculations results in a much more cost-effective emissions reduction of $33,757.44 per ton. However, as explained further below, the 7% interest rate is outdated and a 20-year lifetime is not realistic.

In a March 2014 presentation by the South Coast Air Quality Management District ("SCAQMD") concerning the cost-effectiveness of SCR for refineries, the SCAQMD's analysis (using the same levelized cash flow method used by the District) assumed a 4% interest rate and 25-year life of the equipment.[12] These assumptions are more realistic than Alon's or the District's. Alon's financial reports indicate that it is capable of securing capital at an interest rate lower than 4%.[13] And as explained by refinery expert Dr. Phyllis Fox in comments on a cost-effectiveness analysis of SCR in a similar context, "[f]or these types of analyses, the Office of Management and Budget ("OMB") directs that a real interest rate be used [i.e., adjusted to remove the effects of inflation and to reflect the real costs of funds to the borrower]. When the [EPA] Cost Control Manual was developed, the real interest rate was 7%. However, the latest real interest rate for cost-effectiveness analyses published by OMB is 1.9% for a 30-year period."[14] Thus, even a 4% interest rate is highly conservative.

With respect to the equipment lifetime, ample evidence indicates that SCR typically has a lifetime of 30 years or more. A study of the economic risks from SCR operation at the Detroit Edison Monroe power plant, for example, used 30 years as the anticipated lifetime.[15] Further, in

---

[11] EPA Pollution Control Cost Manual, Sixth Edition (January 2002), available at http://www.epa.gov/ttncatc1/dir1/c_allchs.pdf (Exhibit K).

[12] *See* NOx RECLAIM Working Group Meeting, March 18, 2014, p. 13, available at http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/regxx/reclaimwgm031814.pdf?sfvrsn=2 (Exhibit L).

[13] *See* Alon U.S.A. Energy, Inc., Form 10-K for Fiscal Year 2013, March 2014, PDF 79, 92 available at http://www.sec.gov/Archives/edgar/data/1325955/000132595514000013/alj-20131231x10k.htm (Exhibit M); Alon U.S.A. Energy, Inc., Form 10-Q, 9/30/2014, available at http://quote.morningstar.com/stock-filing/Quarterly-Report/2014/9/30/t.aspx?t=XNYS:ALJ&ft=10-Q&d=acdd8e2f9a21686b6e4d53b46613845b, p. 10 (noting interest rate swap agreements resulting in average fixed interest rate of 0.25% in 2014; 0.60% in 2015; 1.47% in 2016; 2.35% in 2017; 3.09% in 2018 and 3.28% thereafter); *id.*, p. 16 (noting recent loan agreement at annual rate of LIBOR plus 3.75% margin) (Exhibit N [PDF 18, 30]).

[14] Fox, Phyllis, Report on Hydrogen Cyanide Emissions From Fluid Catalytic Cracking Units (October 28, 2014), pp. 23-24 (Exhibit O), citing OMB Circular No. A-94, Appendix C, Revised February 7, 2014, available at: http://www.whitehouse.gov/sites/default/files/omb/memoranda/2014/m-14-05.pdf (Exhibit P). Dr. Fox's resume is attached as Exhibit Q.

[15] S.D. Unwin and others, Selective Catalytic Reduction (SCR) System Design and Operations: Quantitative Risk Analysis of Options, Presented at CCPS 17th Annual International Conference: Risk, Reliability, and Security, p. 3, available at: http://www.unwin-co.com/files%5CSCR-Risk-Paper,CCPS-RRS2002.pdf (Exhibit R).

EPA's response to comments on the approval of a final rule determining that SCR was the "best available retrofit technology" and "most cost-effective" technology for the San Juan Generating Station, a coal-fired power plant in New Mexico, EPA justified a 30-year lifetime of the SCR assumed in its cost-effective analysis:

> The lifetime of an SCR, which is a metal frame packed with catalyst modules, is equal to the lifetime of the boiler, which might easily be over 60 years. *The lifetime of a retrofit SCR is generally set equal to the remaining useful life of the facility.* The record is silent on the remaining useful life of the [San Jaun Generating Station] units. Further, USGS studies of the coal reserves upon which the [San Juan Generating Station] relies indicate that the local coal supply is adequate to support a remaining useful life of 30 years. Many utilities routinely specify 30+ year lifetimes in requests for proposal and to evaluate proposals. In fact, an analysis prepared by [Black & Veatch] for another facility assumed a 40 year SCR lifetime. And finally, Sargent & Lundy assumed a design life of 30 years for the nearby Navajo Generating Station which burns a similar coal. We conclude there is nothing in the record to support a 20 year lifetime for the SCR and believe a 30 year lifetime is justified.[16]

Here, the expected life of the project is 30 years.[17] It is therefore reasonable to assume that the remaining useful life of the facility and of the SCR equipment is at least 30 years.[18]

Using the more realistic assumptions of a 30-year equipment life and a 1.9% real interest rate results in a capital recovery ratio of 0.044 and a cost-effectiveness of $15,748.11 per ton, which meets the District's cost-effectiveness threshold. Even the more conservative assumptions of a 4% interest rate and 25-year lifetime results in a capital recovery ratio of 0.064 and a cost-effectiveness of $22,890.68 per ton, which also meets the District's cost-effectiveness threshold. In light of the above evidence showing that the District improperly calculated the cost-effectiveness of SCR, the Administrator must object to the Permit.

---

[16] "Approval and Promulgation of Implementation Plans; New Mexico; Federal Implementation Plan for Interstate Transport of Pollution Affecting Visibility and Best Available Retrofit Technology Determination; Final Rule," 76 Fed. Reg. 52388, 52402 (Aug. 22, 2011), available at http://www.gpo.gov/fdsys/pkg/FR-2011-08-22/pdf/2011-20682.pdf (Exhibit S).

[17] Kern County Draft Environmental Impact Report, Alon Bakersfield Refinery Crude Flexibility Project ("DEIR") (May 2014), pp. 4.5-14, 4.5-15, 4.6-59, available at http://www.co.kern.ca.us/planning/pdfs/eirs/alon_flexibility_project/Alon_DEIR_Vol1.pdf (Exhibit T).

[18] *See also* Ex. O, pp. 22-23 (Fox report noting SCR is typically designed for a lifetime of 30 years and citing papers indicating SCRs that have been operational since as early as 1986); Selective Catalytic Reduction of NOx From Fluid Catalytic Cracking Case Study: BP

Whiting Refinery (April 2002), available at http://www.cormetech.com/brochures/env-03-128%20-%20kunz%200%20Whiting%20Refinery%20FCC.pdf (Exhibit KK [PDF 6, 15, 19]) (indicating SCRs operational since as early as 1986).

2. *Low Temperature Oxidation*

Low temperature oxidation ("LTO") has achieved emissions controls comparable to that of SCR, but the District's analysis did not consider this technology in its BACT analysis. For example, a 16.4-MMBtu/hr Cleaver Brooks CB700 fire-tube boiler was permitted in February 1992 at 40 ppm NOx at 3% O_2. The boiler was subsequently equipped with LTO in October 1996 as a demonstration project. "The LTO system utilizes ozone to oxidize and control various pollutants, including NOx. The LTO system process includes (1) the recovery of waste heat from the flue gas, (2) the oxidation of NOx and CO, (3) the absorption of higher nitrogen and sulfur oxides formed in a scrubber solution, and (4) removal of ozone slip."[19]

Source tests demonstrated that LTO achieved a NOx limit of 5 ppm at 3% O_2.[20] The SCAQMD's Mobile Source Test Vehicle (MSTV 1) was used to collect and continuously analyze flue gases at the exhaust stack of the LTO system. NOx and CO concentrations were recorded every minute. The analysis of these data shows that NOx concentrations were consistently below 5 ppmvd at 3% O_2,[21] which corresponds to 0.0061 lb/MMBtu.[22] The Administrator must object to the Permit because the District's BACT analysis does not take into account the availability of LTO.

3. *CO*

With respect to CO emissions from boilers, Appendix D of the Air District's Authority to Construct Application Review contains no top-down BACT analysis showing how the District concluded that an emissions limit of 50 ppmv CO at 3% O2 is BACT. Application Review PDF 38 (Exhibit 1); *see* Appendix D to Application Review, PDF 477-81.

In addition, lower emission rates are technologically feasible. Oxidation catalysts are used on many combustion sources outside of the refining industry. [23] These catalysts can remove over 90% of the CO and VOCs and represent the top technology for CO and VOC control for

---

[19] South Coast Air Quality Management District, LAER/BACT Determination for Application No. 343185, available at http://www.aqmd.gov/docs/default-source/bact/laer-bact-determinations/other-technologies/laer-bact-determination-259724.pdf?sfvrsn=2 (Exhibit U).

[20] *See* Best Available Control Technology Determination Data Submitted to the California Air Pollution Control Officers Association BACT Clearinghouse, available at http://www.arb.ca.gov/bact/bact1to3.htm (Alta Dena Dairy) (Exhibit V [PDF 23]).

[21] Ex. U.

[22] NOx emission rate (lb/MMBtu) = [[NOx concentration in exhaust gas (ppmvd) × 10E-6 × NOx molecular weight (lb/lb mole) x F factor in dscf/MMBtu]/[specific molar volume of exhaust gas at standard reference temperature (scf/lb mole)]] × [oxygen correction] = [[5 × 10E-6 × 46.01 x 8710] / 385.3][(20.9% / (20.9% - 3%)] = 0.0061 lb/MMBtu.

[23] BASF, Oxidation Catalysts for Power Generation, available at http://www.catalysts.basf.com/p02/USWeb-Internet/catalysts/en/content/microsites/catalysts/prods-inds/stationary-emissions/catco-pow-gen (Exhibit I).

refinery heaters and boilers. Assuming uncontrolled CO limits of 10 ppm for large heaters and 50 ppm for small heaters, BACT for CO should be no more than 1 ppmvd (15-minute average) for the large heaters and 5 ppmvd (3-hour average) for the small heaters. Because the Air District has not properly shown the CO limits for the boilers is BACT, the Administrator must object to the Permit.

4. Hydrogen Sulfide

Regarding the boilers' sulfur emissions, the District fails to impose any limits on hydrogen sulfide when such controls are feasible. The District's Application Review states that "[n]atural gas with a fuel sulfur content no greater than 5 grains total sulfur/100 scf" constitutes BACT, but makes no mention of a hydrogen sulfide limit. While Alon will meet the total sulfur requirement by firing the new boilers "on PUC regulated natural gas as supplied to them by the utility company," and such gas is limited to a hydrogen-sulfide content of 0.25 grain per 100 standard cubic feet,[24] or 80 ppmv hydrogen sulfide,[25] a lower limit is feasible. The BAAQMD BACT Guidelines have determined that "Natural Gas or Treated Refinery Gas Fuel w/ <.50 ppmv Hydrogen Sulfide" is "cost effective" and "technologically feasible." Ex. A. The Administrator must object to the Permit for failure to impose feasible hydrogen sulfide limits.

C. Stricter Fugitive Emissions Standards for Pumps and Compressors Are Feasible.

For fugitive emissions from pumps and compressors, the District's BACT analysis concludes that a "[l]eak defined as a reading of methane in excess of 500 ppmv above background when measured per EPA Method 21, and an inspection and maintenance program pursuant to District Rule 4455" constitutes BACT. However, this standard does not specify how those emissions will be controlled to ensure leaks do not exceed this limit, and more stringent standards are feasible. Under the BAAQMD BACT Guidelines, a limit of "100 ppm expressed as methane measured using EPA Reference Method" is technologically feasible and cost effective for both compressors and pumps. Ex. A. The Administrator must object to the Permit for failure to impose feasible limits on fugitive emissions from pumps and compressors.

II. The Air District's Calculation of Baseline Emissions Violates District Rule 2201 and Does Not Represent Normal Source Operation.

The Air District has chosen the calendar year 2008 as the baseline year for purposes of calculating the project's "increases in stationary source emissions" for emissions offset purposes. *See* Application Review, Appendix F, PDF 491 (Exhibit 1) ("Baseline period taken to be calendar year 2008, in accordance with Rule 2201 § 3.9, as described in the ATC application.").

---

[24] *See* General Order 58-A titled "Standards For Gas Service In The State of California," title 7(a), (b), available at: http://docs.cpuc.ca.gov/PUBLISHED/GENERAL_ORDER/54827.PDF (Exhibit W).

[25] *See* Santa Barbara County Air Pollution Control District, Frequently Asked Questions, available at: http://www.ourair.org/eng/tech/frequently-asked-questions/ (noting PUC's hydrogen sulfide limit for natural gas is equivalent to 80 ppmv hydrogen sulfide) (Exhibit X).

Because this baseline violates District Rule 2201 and does not represent normal source operation, the Administrator must object to the Permit.

In order to determine the refinery's baseline air emissions under the Air District's New and Modified Stationary Source Review Rule, Rule 2201, the Air District had two options applicable here.[26] It could choose either:

> 3.9.1 the two consecutive years of operation immediately prior to the submission date of the Complete Application; or
> 3.9.2 at least two consecutive years within the five years immediately prior to the submission date of the Complete Application if determined by the APCO as more representative of normal source operation. . . .

The Authority to Construct application was submitted on October 25, 2013. Thus, under Rule 2201, the Air District could have chosen as the baseline years either (1) October 25, 2011-October 25, 2013; or (2) any two or more consecutive years between October 25, 2008 and October 25, 2013 if the Air District determined these years were more representative or normal source operation. Instead of complying with Rule 2201, however, the Air District erroneously chose the period from January 1, 2008 to December 31, 2008—outside of the timeframe allowed by the rule and shorter than the required period of two consecutive years.

Because no crude refining operations have occurred since December 2008, the Authority to Construct should have reflected a baseline of zero emissions (years 2009-2010) as the most "representative of normal source operation." Conditions at the Refinery have changed dramatically since 2008. Although the plant was designed to refine crude oil, it went into bankruptcy on December 21, 2008 and stopped processing crude and other feedstock; it was still non-operational when purchased by Alon USA in 2010.[27] Following the change in ownership, the plant was refashioned to convert intermediate vacuum gas oil into finished products, rather than process crude oil.[28]

The Refinery only began operating again in this limited capacity in June 2011, after two-and-half years of being shut down.[29] No crude refining operations were resumed.[30] In 2012, gas oil processing operations were "intermittent," only occurring "from June to early November." DEIR, p. 3-19. The average throughput in 2011 and 2012 was only 10,915 and 4,751 bpd, or

---

[26] The other two options under Rule 2201 for calculating the baseline emissions don't apply ("3.9.3 a shorter period of at least one year if the emissions unit has not been in operation for two years and this represents the full operational history of the emissions unit, including any replacement units; or 3.9.4 zero years if an emissions unit has been in operation for less than one year (only for use when calculating AER)."). The emissions units evaluated were either in place for more than one year or newly proposed.

[27] *See* Alon USA, Annual Report (Form 10-K) (March 14, 2013), PDF 47 (Exhibit Y).

[28] *See* Alon USA, Quarterly Report (Form 10-Q) (Aug. 8, 2011), PDF 35 (Exhibit Z).

[29] *See* Alon USA, Quarterly Report (Form 10-Q) (May 9, 2012), PDF 33 (Exhibit AA).

[30] *Ibid.*; DEIR, p. 3-19.

15.5% and 6.8% of the Refinery's daily capacity of 70,000 bpd. *Ibid.* Operations were suspended entirely in December 2012.[31] Based on this record, 2008 calendar year operating conditions do not represent the current conditions at the Refinery, and the years the refinery was completely shut down are "more representative of normal source operation." Rule 2201 § 3.9.2.

The Air District has repeatedly recognized that the operation of the refinery more than six years ago is not a representative baseline. On October 14, 2013, the Air District submitted comments on the Notice of Preparation on the DEIR, criticizing Kern County's use of a 2007 baseline as "reflect[ing] the environmental setting in effect 6-7 years ago, which appears to be remote from the conditions in effect at the time the environmental analysis commenced." Ex. CC. Similarly, in response to Alon's request to use years 2007 and 2008 for the purposes of Rule 3170, Chay Thao of the Air District explained in a July 7, 2014 email that:

> [I]n the past, operation of the refinery by the previous owner (Big West) was considerably different than operations under Alon USA. In 2007, the facility was owned by Big West and was processing heavy crude oil to produce gasoline and diesel. Operations were then suspended in 2008 after Big West's bankruptcy. Alon USA purchased the facility in 2010 and then applied for Authority to Construct (ATC) permits to modify the facility to process gas oil, instead of heavy crude oil. This application included modifications to the catalytic reformer #1, amine/fuel gas unit, hydrocracker, depentanizer, and unloading rack to accommodate processing of shipped in gas oil. Piping modifications and installation of two additional loading bays to the unloading rack were also authorized. Alon then commenced operation in 2011 to process gas oil. Since then the facility has only operated intermittently.
>
> Based on these changes, year 2007 and 2008 are not representative of normal source operation and therefore cannot be used for the Baseline Period[.]

See Ex. DD. As the Air District has repeatedly recognized, 2008 is an inappropriate year for baseline calculations as it does not represent normal operations. The Authority to Construct should have reflected that the refinery ceased operating during the baseline period, and the Administrator must object to the Permit for failure to include a proper baseline, resulting in an underestimate of the Project's required emissions offsets.

III. The Assumptions Regarding the Project's Crude Slate Are Flawed.

The Application Review lists various assumptions used in its calculations of the Project's emissions, but these assumptions are not consistent with the Project's objective to import and

[31] Ex. Y, PDF 103; Alon USA, Form 10-Q (May 5, 2014), PDF 11 (noting Alon's California refineries did not process "crude" in 2013 and first quarter of 2014) (Exhibit BB).

process "cost-advantaged" light Bakken crude oil. [32] The Administrator must object to the Permit on the basis that it does not reflect the importation, storage, and processing of the anticipated crude oil processed by the Project.

The Application Review states that the "[c]rude oil density" of crude that will be unloaded with the new railcar unloading rack is "0.915 g/mL (per Applicant)," but this figure does not represent the worst case in terms of VOC emissions. Application Review at 19*; see also id.* ("All liquids transferred will be conservatively assumed to be light crude oil....").[33] This crude oil density is within the range of heavy crude oil, not light crude oil, which will most likely be unloaded and processed at the Refinery. According to the Transportation Safety Board of Canada's study of crude oil samples taken from the oil train that derailed in Lac-Mégantic, Quebec, Bakken crude can have a density as low as .8165 g/mL.[34] The National Energy Board of Canada defines light crude oil as having a density equal to, or less than, 875.7 kg/m^3 (or .8757 g/mL) while heavy crude oil is defined as having a density greater than this threshold.[35]

In addition, while the Application Review notes that the Reid Vapor Pressure of the crude oil that will be stored in floating roof tanks is assumed to be 9 psia, this figure is not representative of the vapor pressure of Bakken crude oils, which is more volatile than other light crudes, as explained in the attached report by Dr. Phyllis Fox commenting on the final EIR for the Project. *See* Ex. GG at pp. 4-10 and accompanying references to the comment letter. As Dr. Fox explains, Bakken crude oils typically have a higher Reid vapor pressure than other light crude oils, including a Reid Vapor Pressure of up to 15.5 psia, which results in significantly higher emissions of VOCs and toxic air contaminants ("TAC"). The District's emissions analysis should have therefore reflected the higher vapor pressure and VOC and TAC emissions of Bakken crude oil. Moreover, tank inspection and monitoring requirements are too weak to ensure that fugitive emissions from the tanks are adequately controlled. District Rule 4623 § 6.1 only provides for tank inspections "on an annual basis" by the District. There are no other monitoring measures to ensure that the Project's tanks do not exceed the Reid Vapor Pressure assumed in the Air District's analysis and that fugitive emissions will not exceed the limits set forth in the

---

[32] Kern County Final EIR for the Alon Bakersfield Refinery Crude Flexibility Project, vol. 3, Attachment F, PDF 553, available at http://www.co.kern.ca.us/planning/pdfs/eirs/alon_flexibility_project/Alon_FEIR_Ch7_RTC.pdf (Exhibit EE) ("The Bakken Region will be the most likely source for crude to be transported to the proposed crude oil rail terminal to be located at the Bakersfield Refinery."); see also id., Attachment E, PDF 489, 528 (discussing Refinery's shift to lighter Bakken crudes); *id.* PDF 519-20 (noting Bakken crude's lower cost making it more attractive to process).

[33] The Application Review fails to note the temperature at which this density occurs. Since density is a function of temperature, it is unclear as to what type of crude oil is actually assumed in the District's analysis.

[34] Transportation Safety Board of Canada, TSB Laboratory Report LP148/2013, section 2.4, available at http://www.tsb.gc.ca/eng/enquetes-investigations/rail/2013/R13D0054/lab/20140306/LP1482013.asp (Exhibit FF).

[35] *See id.*, section 3.2.5 & notes 42-43 therein.

Authority to Construct. Because the Air District used faulty emissions assumptions that lead to an underestimate of the Project's required offsets, the Administrator must object to the Permit.

IV. The Retrofit of Existing Heaters Are Not Exempt from Emissions Offsets.

The Application Review notes that because three existing heaters are being retrofitted solely to comply with District rules, the heaters are exempt from emissions offset requirements. However, all of the conditions for this exemption are not met in this case. *See* Section 4.6.8 ("For existing facilities, the installation or modification of an emission control technique performed solely for the purpose of compliance with the requirements of District, State or Federal air pollution control laws, regulations, or orders, as approved by the APCO, shall be exempt from offset requirements for all air pollutants provided all of the following conditions are met...") This includes condition 4.6.8.1, which requires that "[t]here shall be no increase in the physical or operational design of the *existing facility*, except for those changes to the design needed for the installation or modification of the emission control technique itself." (emphasis added). Here, the existing facility will undergo significant changes in its physical and operational design, including an increase in the Refinery's capacity to unload crude at the rail terminal and an increase in its capacity to refine both heavier and lighter crudes.

These changes will result in increased emissions from the existing heaters that are being retrofitted, which must be offset. According to Alon, at least two of these heaters have been dormant for some time, and under the project, they will be reactivated. *See* Ex. HH (Kern County Environmental Impact Report Appendices noting post-project emissions of 19.44, 9.72, and 22.69 tons per year of CO from existing heaters compared to 0 tons per year under 2007 baseline conditions, and of 3.83, 2.40, and 4.47 tons per year of NOx compared to 0.30 tons per year under baseline conditions)[36]; Ex. II at 19 (Project Application noting heaters 21-H21 and 27-H2 were dormant during baseline period).[37] Because these heaters lack emissions offsets, the Administrator must object to the Permit.

V. All of the Emission Reduction Credits Proposed Are Invalid.

The Air District has proposed to use emission reduction credit (ERC) certificate numbers S-4334-2, S-3465-5, S-3462-4, S-3458-3, and S-3663-1. Application Review at 46. These emission reductions credits come from three separate shutdowns or curtailments at the facility, all of which occurred decades ago: (1) the 1977 incineration of coker exhaust in the CO boiler—almost four decades ago (ERC S-3458-3, and S-3663-1); (2) the 1983 shutdown of the catalytic cracker, fluid coker, and CO boiler—more than three decades ago (ERC S-4334-2 & S-3465-5); and (3) the shutdown of the tailgas incinerator in 1992—more than two decades ago (ERC S-3462-4). *See* Ex. JJ.

---

[36] *See* DEIR volume 2, Appendix B, available at http://www.co.kern.ca.us/planning/pdfs/eirs/alon_flexibility_project/Alon_DEIR_Vol2%20Cultural%20Redactions.pdf (Exhibit HH).

[37] For the same reasons, this modification is neither exempt from BACT. *See* Rule 2201 § 4.2.3 (requiring same conditions for BACT exemption).

Under District Rule 2201 and 2301, emission reductions used as ERCs must be "real, enforceable, quantifiable, surplus, and permanent." Rule 2201 § 3.2.1; Rule 2301 § 4.1. Given the many changes that have occurred at the refinery since 1977, including the recent shutdown and previous reconfigurations of the refinery, these decades-old reductions are no longer "real" and will not actually offset the refinery's significant projected air emissions. The notion that these shutdown units could still be operational today and "offset" the existing refinery's emissions, after the many reconfigurations and shutdowns that the refinery has undergone, is purely fictional.

Moreover, as explained below, all of the ERC credits are either invalid or may not be employed here. Because the Permit does not include valid ERC credits, the Administrator must object to the Permit.

A. The Air District May Not Employ Banked Offsets for NOx and VOC Emissions.

The Air District proposes to offset the project's NOx and VOC emissions with ERC S-4334-2, for the 1983 "shutdown of catalytic cracker, fluid coker, & CO boiler," and with ERC S-3663-1, for the 1977 "incineration of coker exhaust in CO boiler." Ex. JJ. Because the District may not approve the use of offsets for NOx and VOC emissions until the 1-hour ozone plan is approved by EPA, the Administrator must object to the issuance of the Permit in reliance on these offsets.

Air District Rule 2201 § 4.13.1 requires that "Major Source shutdowns or permanent curtailments in production or operating hours of a Major Source may not be used as offsets for emissions from . . . a Federal Major Modification . . . unless the ERC, or the emissions from which the ERC are derived, has been included in an EPA-approved attainment plan."

The San Joaquin Valley air basin is currently designated as in extreme nonattainment with the 1-hour standard for ozone, for which NOx and VOC emissions are precursors. The District does not yet have an approved attainment plan for the 1-hour ozone standard. Thus, the Air District may not use these banked emission reduction credits to offset the NOx and VOC emissions of this Project.

B. Emission Reduction Credit Certificates S-3458-3 and S-3663-1 Are Invalid.

ERC S-3458-3, for CO reduction, and S-3663-1, for VOC reduction, state that they were issued for "incineration of coker exhaust in CO boiler." Ex. JJ. The authority to construct for the CO boiler was issued on January 12, 1976, and operations began in May of 1977.[38] Because these reductions occurred prior to August 7, 1977, the credit given for these reductions is invalid, and may not be used here to offset project emissions. *See* 40 C.F.R. § 51.165(a)(2)(ii)(C)(1)(ii) ("in no event may credit be given for shutdowns that occurred before August 7, 1977.").

---

[38] *See* Letter, Raymond E. Menebroker, CARB, to Citron Toy, Kern County Air Pollution Control District (July 17, 1987) (Exhibit LL).

Both EPA and the California Air Resources Board (CARB) submitted comments on the proposed emission reduction credits, explaining the many reasons why the credits are invalid.[39] Both EPA and CARB pointed out that credits were invalid because the application for banking credit was submitted beyond the required time limits; a completed application was not submitted until October 1985, almost ten years after the reduction occurred. EPA also explained:

> The reductions from the installation of the CO boiler are quite old. The burden is on the District to verify in its analysis that these reductions have not been assumed elsewhere (in the emissions inventory, the latest [air quality management plan], the attainment demonstration) and therefore are indeed surplus. In all likelihood, these reductions are not surplus since they occurred so long ago and probably are already reflected in the District's records and plans. The District must verify that these reductions are not credited elsewhere.

Ex. LL. The District did not provide EPA with verification that these reductions were not credited elsewhere. EPA further explained:

> The reductions occurred prior to August 7, 1977 and are therefore too old to be granted credit. EPA has previously advised the District that banking credit may not be awarded for any reductions which occurred prior to the Clean Air Act Amendments of August 7, 1977. . . EPA will not recognize these reductions as valid offsets for any source wishing to purchase these ERCs for offsetting purpose.

Ibid. EPA warned that "any source which attempts to use these emission reductions as an offset may be subject to federal enforcement action." *Ibid.*

Because ERCs S-3458-3 and S-3663-1 are invalid and "subject to federal enforcement action" if used, the Administrator must object to the Permit.

C. Emission Reduction Credit Certificate S-3462-4 Is Invalid.

ERC S-3462-4, for PM10 reductions from the March 1992 shutdown of the tailgas incinerator, does not represent the bankable emission reduction from this shutdown, and is therefore invalid.

In the application review for ERC S-3462-4, the Air District explained that the emission reductions eligible for an emission reduction credit certificate include the baseline emissions of the tailgas incinerator reduced by a 10% deposit into the "Community Bank". *See* Application review at 5 ("10% of AER shall be deposited to the Community Bank; remaining AER qualifies for the ERC Certificate.") (Exhibit NN). With this reduction, the Air District stated that the Bankable Emission Reductions, available for an ERC Certificate, were:

---

[39] *See* Letter, Raymond E. Menebroker, CARB, to Citron Toy, Kern County Air Pollution Control District (July 17, 1987) (Exhibit LL); Letter, David Howecamp, EPA, to Leon Hebertson, KCAPCD, (July 17, 1987) (Exhibit MM).

Quarter 1 Jan-Mar	Quarter 2 Apr-Jun	Quarter 3 Jul-Sep	Quarter 4 Oct-Dec.
1,425.41 lbs	1,689.42 lbs	1611.54 lbs	1,776.42 lbs

Id. at 6. However, the Emission Reduction Certificate issued did not take the 10% reduction into account, and erroneously issued credits as:

Quarter 1 Jan-Mar	Quarter 2 Apr-Jun	Quarter 3 Jul-Sep	Quarter 4 Oct-Dec.
1,584 lbs	1,877 lbs	1,791 lbs	1,974 lbs

See Ex. JJ, ERC S-3462-4. Because this Certificate fails to comply with Air District Rule 2201 § 4.12.1 and 2301 § 4.2.2, it is invalid and the Administrator must object to the Permit.

D. Emission Reduction Credit Certificate S-4334-2 and S-3465-5 Are Invalid.

ERCs S-4334-2 and S-3465 state that they were issued for the "shutdown of catalytic cracker, fluid coker, & CO boiler." Ex. JJ. Because these certificates were originally applied for in 1987, more than 90 days after the 1983 shutdown occurred, the application was not timely filed and the certificates are invalid. *See* Letter from Leon Hebertson to L.E. Perrier (Aug. 27, 1987) (Exhibit OO).

The Air District acknowledged as much. In a letter on August 27, 1987 to Texaco Refining (the predecessor to the Alon Bakersfield Refinery), the Air District denied Texaco's original emission reduction credit application as untimely, explaining that:

> On July 31, 1987 we received your applications for Emission Reduction Credit Banking Certificates resulting from the November, 1985 [sic] shutdown of the Tosco T.C.C. Unit, Fluid Coker, and CO Boiler. Review of these applications reveals that this request is not timely. Rule 210.3 § C.4.(b) requires applications for banking of emissions reductions to be submitted within 90 days after such reduction occurs. Because your proposal does not comply with this requirement, your applications for Emission Reduction Credits Banking Certificates must be denied within 30 days.

Ex. OO. After Texaco objected to the Air District's denial, the Air District reversed course and granted the requested emission reduction credits on April 14, 1988. In explaining the change, the Air District capitulated to Texaco's erroneous interpretation that because Texaco had maintained its operating permit, it had not actually "shutdown," even though the equipment had last been operated in 1983. Application Review for Application #s 2007130/101, '130/201, '130/401, '130/501, and '130/601 (Jan. 14 1988) (Exhibit PP) at 2. This interpretation, however, conflicts with Rule 2301 § 3.14, which defines "shutdown" for the purposes of awarding emission reduction credits as "either the *earlier* of the permanent cessation of emissions from an emitting unit or the surrender of that unit's operating permit." (emphasis added).

The Air District had it right the first time: the application was untimely because it was received more than 90 days after the shutdown occurred. ERC certificates S-4334-2 and S-3465 are therefore invalid and may not be used to offset this project's NOx and SOx emissions. Because the Permit fails to include valid emission reduction credits, the Administrator must object to the Permit.

CONCLUSION

For the foregoing reasons, the proposed Permit does not comply with the Clean Air Act and applicable regulations, and the Administrator must object to the issuance of the Permit.

Dated: December 16, 2014

Respectfully Submitted,

Elizabeth Forsyth
Wendy Park
Earthjustice
50 California St., Suite 500
San Francisco, CA 94114
415-217-2000