

Via email to:
Amy Million, Principal Planner
Community Development Department
250 East L Street
Benicia, CA 94510
amillion@ci.benicia.ca.us

From: Charles Davidson. Hercules CA 94547

Re: The City of Benicia's Revised Draft Environmental Impact Report for the
Valero Benicia Crude-by-Rail Project

Dear Ms. Million,

I oppose the Valero Crude by Rail Project and their Revised Draft EIR for the following reasons, submitted below. Outstanding is Valero's use of the term "Alaska North Slope look-alike", which is to hide and obscure the unusual and extreme qualities of crude that Valero desires to bring to Benicia.

I will quote Communities for a Better Environment's statement and a previous legal outcome about processing heavy crudes, because it has direct implications for the intentional obfuscation of crude oil quality presented in the Benicia Valero Crude by Rail Project Revised Draft Environmental Impact Report (EIR):

"In *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, the First District Court of Appeal specifically rejected an EIR for a refinery project that failed to disclose detailed information about the crude slate that a refinery was already processing compared to the crude slate it would process if the project under consideration were approved. The court stated that "the EIR fails as an informational document because the EIR's project description is inconsistent and obscure as to whether the Project enables the Refinery to process heavier crude".

According to Valero, the North American crude mixtures that they plan to process will be "Alaskan North Slope (ANS) look-alikes or sweeter," and will replace similar crudes that are currently delivered by ship. In a similar vein, Valero claims that they will blend crude imports to stay within "the yellow box in Figure 3-8" of the Draft EIR, which demarcates the ranges of sulfur content and API gravity permitted under Valero's BAAQMD permit. (Draft EIR at 3-13 to 3-14.)

Specifically, the Valero Crude by Rail project RDEIR declared that: "Valero has publicly stated that, when the Project is constructed and operational, Valero plans to purchase relatively light sweet North American crudes." This light sweet crude, however, is only half of the feedstock that Valero plans to import, while the other half will be such heavy and sulfurous crudes that would singularly be the heaviest

and sourest of all global crudes.

Thus, Valero is stating that its Benicia CBR Project is to bring in by train North American Crudes, that can only be either or both very heavy solvent-diluted Canadian tar sands bitumen (DilBit) or very lightweight Bakken North Dakota crude oil. Thus, the Alaska North Slope (ANS) "look-alikes", would conceivably exist within a narrow weight and sulfur range and still be some mixture of DilBit and Bakken crude. These two North American crudes, at exactly the opposite ends of the weight and sulfur spectrum, could be and would be the only crude by rail (CBR) deliveries to Northern California that could be delivered in significant amounts, as intended by Valero. This prospect also rules out, for Valero, authentic ANS and foreign crudes are delivered by ship and California crude can be delivered by pipelines to certain refineries.

Most importantly, Valero's proposed ANS "look-alike" terminology obscures the profound chemistry differences between Alaska North Slope crude, on one hand and their special mixture of tar sands DilBit and Bakken crude, on the other. This is the crux of my critique of the Valero CBR Project:

In contrast to Alaska North Slope Crudes, DilBit has much higher proportions of toxic heavy metals and petroleum coke precursors. Thus, if DilBit and Bakken crude were combined in approximately a 50%/50% (1:1) mixture, the heavy metal content and petcoke production levels would still far exceed ANS crude levels of these, although the API density and sulfur content could conceivably be similar to ANS crude. In other words, the mixture might look and smell like ANS crude, but its complex chemistry will be far different, with numerous ramifications and potential negative consequences.

These negative ramifications of using Valero's proposed ANS "look-alike" crude, composed of a DilBit/Bakken mixture are several-fold and listed below:

- 1) Petroleum coke, i.e. PetCoke, is produced in abundance when refining bitumen or DilBit. PetCoke is composed of very high molecular weight complex hydrocarbons, called asphaltenes, which are highly adhesive and make DilBit very difficult to process into gasoline. This complicates refining bitumen and translates directly into a significant increase in refinery greenhouse gasses due to the extreme processing for breaking down asphaltenes into smaller molecules, like gasoline.

These extreme processing needs requires Valero to produce a) extra refinery-produced hydrogen, that was increased by over 10% in the Valero Improvement Project, in addition to b) higher furnace temperatures (that are needed to liquefy and then thermally break down the asphaltene molecules). Thus, the Valero CBR Project and the Valero Improvement Project, when combined, will significantly increase Valero's refinery GHG production. The refinery will also be using an increase throughput of natural gas to accommodate these aspects of bitumen refining.

2) Bitumen, having an API weight of 8, is nearly a solid without the addition of either a) greater amounts of heat or b) significant dilution with lightweight hydrocarbon solvents. It is this high molecular weight bitumen that will still be processed at Valero if the CBR project is approved, despite its being dissolved first into DilBit. Valero's CBR imports of lightweight Bakken crude will also be used to function as a DilBit solvent in order to create their so-called ANS "look-alike" that is nothing like ANS crude. To understand bitumen weight and density in perspective to ANS crude, the comparison is described below:

Unconventional oil, defined in Section 3, can be produced from three distinct resources. First are the heavy oil/extra heavy oil reservoirs like the Kern River Field in California and the large fields on the North Slope of Alaska. Most of the heavy oil being produced from these reservoirs has an API gravity between 10°–20°. Second are the oil sand reservoirs like the Athabasca region in Alberta, Canada and the Uinta and Paradox Basins in Utah. The bitumen associated with oil sands typically has API gravities of 10° or lower. Third are the oil shale deposits, which are located predominantly in the western United States. The kerogen impregnated in the shale has an API gravity of less than 10°.

P. 78. A Technical, Economic, and Legal Assessment of North American Heavy Oil, Oil Sands, and Oil Shale Resources In Response To Energy Policy Act of 2005 Section 369(p) Work Performed Under DE-FC-06NT15569. Prepared for U.S. Department of Energy Office of Fossil Energy and National Energy Technology Laboratory

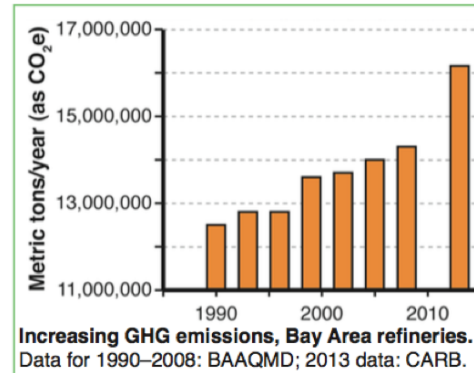
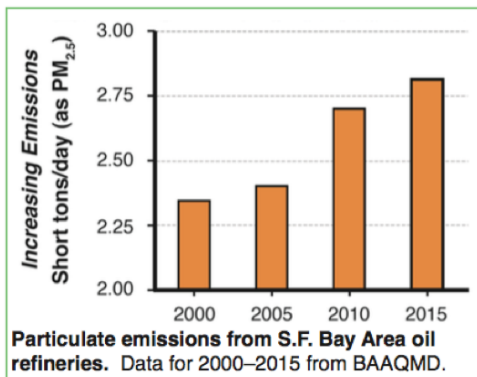
Thus, kerogen-derived bitumen will always be present at Valero should the CBR project proceed, despite any amount of dilution. It should be added that other extra heavy crudes, such as Venezuelan, though almost as high in sulfur and weight like Canadian tar sands, has much less bitumen, is far less adhesive and produces a much lower GHG footprint when refining.

3) The very large, high molecular weight *asphaltene* molecules, combined with the lightweight solvents present in DilBit, make spill remediation impossible under a number of circumstances, such as the 2010 Enbridge Kalamazoo River spill in Michigan, which was essentially indelible despite over one billion dollars spent to date on cleanup. The reason was that DilBit deeply enters the soil, then after the light solvent evaporated, the heavy bitumen remained deeply embedded. There should be great concern that Valero plans to import crude by rail which would possibly transverse the Feather River Canyon or the Delta, two water sources highly critical towards California's water needs.

4) The high sulfur, heavy metal and naphthenic acid content of DilBit and the increased temperatures required to process bitumen will tend to speed up the sulfidic corrosion of refinery machinery, that could cause a refinery catastrophe, such as the fire at Chevron in Richmond in 2012, as determined by the U.S Chemical Safety Board. Moreover, the adhesive properties of bitumen will tend to plug machinery, which could cause an event similar to last year's solvent deasphalter emergency flaring at Chevron. Such events are a safety threat to both the nearby

community and the refinery workers themselves.

5) As the refineries in the Bay Area have been more intensively processing crudes, generally and using heavier crude slates within the past decade and a half, greenhouse gas and particulate matter (PM) have steadily increased in parallel. These linked GHG-PM increases have occurred despite progress made in reducing such pollutants as sulfur dioxide. These GHG and co-pollutant PM increase data are derived by CBE from data from the State's California Air Resources Board (CARB) and the nine-county Bay Area Air Quality Management District (BAAQMD, which is under the auspices of CARB). Particulate matter increases are a public health concern, such as regarding asthma, which would be aggravated by the increased local processing of bitumen. I have included this data as attached graphs, below:



* Raw agency data compiled by CBE.

6) The importation of Bakken crude by rail is a major public safety concern, such as occurred at the 2013 Lac Megantic disaster in Quebec. While similarly lightweight Texas shale oil crudes are stripped of propane and butane (liquid petroleum gas or LPG) before transport, in a process called “stabilization”, this is not being done for Bakken North Dakota crude, ostensibly for both economic and transportation reasons.

Texas, but not ND, has an established pipeline infrastructure due to pipeline vapor pressure limits of 9 pounds per square inch (PSI). However, the stated 13.5 PSI limit in ND for Bakken crude railroad tanker cars is 50% higher than the Texas pipeline limit of 9 PSI. The ND limit vastly understates the safety threat of transporting unstabilized crude.

A recent study by Ametek and Sandia National Laboratories found that during the summer months, in a full tanker car containing Bakken crude, the vapor pressure can exponentially jump to well over 30 PSI. Between ND and California, during the summer months, temperatures within the tanker cars could easily exceed 100 degrees. The vast disparity between the 9 PSI for Texas crude transport and the

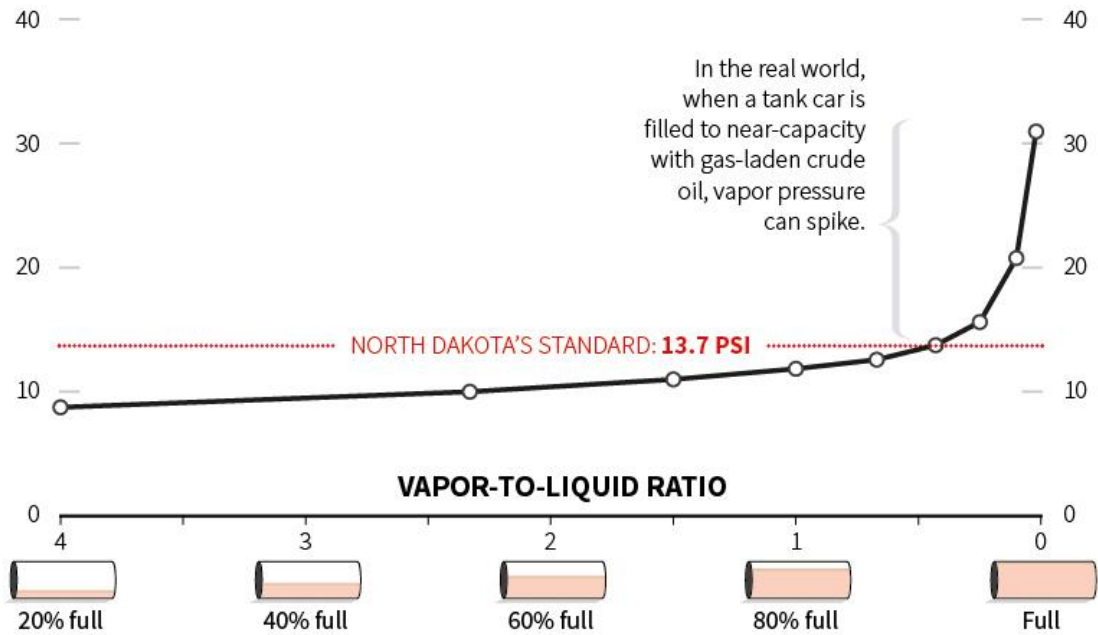
actual Bakken 30-Plus PSI is for about one third of the year and is entirely due to the fact that LPG is allowed to remain within Bakken crude. This LPG inclusion in Bakken crude oil is despite widespread public protestations against this practice and a failed attempt at Congressionally-mandated regulation by Rep. Garamendi (D-CA).

Vapor pressure in oil trains

North Dakota's standard will detect vapor pressure using a mostly-empty container but tank cars are practically fully-loaded when they move from field to refinery. Vapor pressure can rise significantly above the state's 13.7 psi threshold in real-world conditions.

VAPOR PRESSURE OF CRUDE OIL

Pound per square inch (psi)

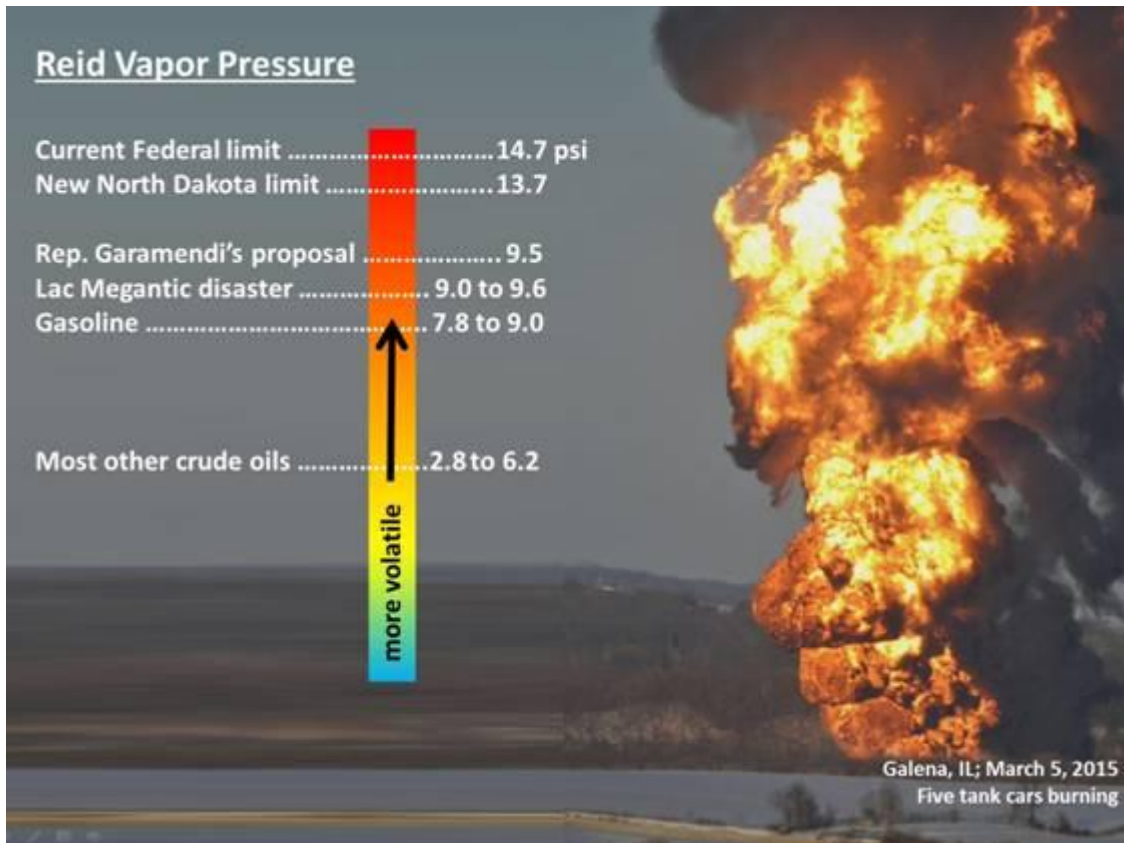


Note: Chart reflects vapor pressure readings of crude oil at different fill levels at 37.8°C/100°F.

Sources: Ametek; Reuters.

C. Chan, P. Rucker, 26/03/2015

REUTERS



As a testament to Bakken's extreme flammability, the dramatic fireball displays in films of the 2013 Casselton ND train derailment and fire were of 250 foot fireballs that rose in a solid 600 foot column of fire, for each tanker car. Moreover, both the Lac Megantic and Casselton fires occurs during the winter months at very low temperatures, suggesting that the heat and sparks from metal-on-metal derailment event will likely ignite the released propane and butane first, rapidly followed by the other crude fractions.

The gravity of a Bakken crude by rail fire would have profound and catastrophic public safety consequences in Benicia, in numerous California rail line communities and possibly anywhere between ND and Benicia.

In a Letter to the BNSF Railroad CEO, in regards to the limited ability to extinguish a Bakken CBR derailment fire, the Washington Fire Chiefs association Executive Director Wayne Senter stated:

The WFC is well aware that even if an infinite amount of foam was available, we can only provide *defensive firefighting*. [Emphasis mine] This assumption is based on the guidance from the US Department of Transportation [DOT] Emergency Response Guidebook [Guide 127 and 128 on ethanol and crude oil, respectively] recommending a 1/2 mile evacuation zone if only one tank car of these

combustibles/flammables is involved in a fire.

7) Another consequence of Bakken's high vapor pressure is that the pressure will tend to drive out of solution, into the environment, much more toxic hydrocarbon vapors, such as highly carcinogenic benzene. (See above, Bakken crude PSI data from Amatek and Sandia National Laboratories.)

8) The Carnegie Endowment study entitled: *Know Your Oil: Creating a Global Climate Oil Index*, which compared the overall well-to-wheel GHG footprint of 30 global crudes found that both DilBit and Bakken crude are at the top of the list of GHG polluters. The extremely high GHG's from DilBit are due to the GHGs produced at both the levels of refining bitumen and extracting (bituminous) kerogen. The high GHGs from Bakken crude is primarily at the extraction level, regarding the lack of adequate methane containment protocols in ND. There the intentional flaring of methane can be seen from outer space, in addition to the fugitive release of unburned methane, that itself has a huge global warming potential.

9) The transport of crude by rail to California refineries from Valero and other refineries, that has not occurred for many decades and only then at smaller levels, is an unacceptable infringement upon the public health, safety and quality of life millions of Californians, not for the least reason being the additional diesel pollution and road congestion that would ensue near homes, schools and businesses.

For these nine reasons, I implore the City of Benicia to reject the Valero Crude by Rail Project Revised Draft EIR.

Charles Davidson
Hercules CA 94547