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April 19, 2016

BY EMAIL

Honorable Mayor Patterson and City Council Members
City of Benicia
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Re: Valero Crude by Rail Project (12PLN-00063)

Dear Honorable Mayor Patterson and City Council Members:

We are writing on behalf of Safe Fuel and Energy Resources California ("SAFER California") to provide additional information for the City Council's consideration of Valero's appeal of the Planning Commission's unanimous decision to deny the Use Permit Application for the Valero Crude by Rail Project. On April 4, 2016 and April 18, 2016, we submitted comments on Valero's appeal and we provided additional information regarding the Project's significant impacts both within and outside the refinery boundary. Our comments included analyses from refinery expert Dr. Phyllis Fox. Attached are additional comments from Dr. Fox regarding the Project's significant air quality and public health impacts from operational emissions at the proposed unloading rack.[1]

[1] **Attachment A**: Letter from Phyllis Fox to Rachael Koss re: ROG and Benzene Emissions from Unloading Rack Operations, April 19, 2016.

Thank you for your consideration.

Sincerely,

Rachael E. Koss

REK:ric

cc: Donald Dean, Chair, Planning Commission ddean@ci.benicia.ca.us
Amy Million, Principal Planner amillion@ci.benicia.ca.us

3111-024rc

ATTACHMENT A

Phyllis Fox
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Environmental Management
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April 19, 2016

Rachael Koss
Adams Broadwell Joseph & Cardozo
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Re: Impacts from ROG and Benzene Emissions from Unloading Rack Operations

Dear Ms. Koss:

As you requested, I have estimated ROG and benzene emissions and resulting health impacts from Valero's proposed unloading rack operations.

I. RAILCAR FUGITIVE EMISSIONS AT UNLOADING RACKS

I estimated ROG and benzene emissions from railcars for the entire time that railcars would be present within the Refinery boundary in my 4/4/16 comments.[1] In the present comments, I used the same basic methods to estimate ROG and benzene emissions from railcars only during unloading at the Valero unloading racks, using the methods previously described in my 4/4/16 comments. My analysis, presented below, indicates that ROG emissions are significant. Further, benzene present in these emissions result in significant cancer risk and acute health impacts at nearby sensitive receptors.

[1] 4/4/16 Fox Comments, Comments II and III.

A. ROG Railcar Fugitive Emissions During Unloading are Significant and Unmitigated

The unloading scenario described in the EIR indicates "UPRR would turn over operation of the trains to Valero for offloading." Valero would drain the contents of each tank car by gravity into a collection pipe (collection header) and then pump the contents directly into storage tankage located in the Refinery's crude oil storage tank field. When emptied, UPRR would move the tank cars onto the departure spur on the Refinery property adjacent to the unloading rack, where they would be assembled into a 50-car unit train for transport off site. [2]

The unloaded crude oil would be pumped into a new 4,000 foot, 16-inch diameter pipeline between the unloading rack and an existing crude supply pipeline to the Valero Crude Tank Farm for storage.[3] The pump would have a maximum crude oil pumping rate of 4,000 gpm.[4] Thus, the minimum amount of time that the railcars would be at the unloading rack, under Valero control, would be 6 hours,[5] assuming maximum pumping rate. In general, the pump would not be operated at maximum capacity, so the time at the rack under Valero control would be longer.

Using emission factors developed by EPA for marketing terminals, as assumed in Valero's railcar fugitive emission calculations but corrected as noted in my FEIR comments, the on-site ROG emissions per 50-car unit-train during unloading operations controlled by Valero at the Valero unloading rack would be 399 pounds (lb) per visit,[6] 798 lb/day, and 146 ton/yr.[7] The CEQA significance thresholds for ROG emissions established by the Bay Area Air Quality Management District (BAAQMD) are 54 lb/day and 10 ton/yr.[8] Thus, both daily and annual on-site ROG railcar fugitive emissions during unloading operations controlled by Valero at Valero's unloading rack are highly significant and must be mitigated.

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[2] DEIR, p. 3-21.

[3] RDEIR, p. 2-6.

[4] RDEIR, p. 42.

[5] The time to unload 35,000 bbl per unit train = (35,000 bbl)(42 gal/bbl)/4,000 gal/min = 367.5 min = **6.13 hrs.**

[6] Exhibit 1a, cell: I31.

[7] Annual railcar ROG emissions for two 50-car unit trains per day, 365 days/year using marketing terminal emission factors = [(399 lb)/(50-car train) × (2 × 50-car trains/day) × (365 day/yr)]/(2000 lb/ton) = **145.6 ton/yr**.

[8] FEIR, Table 4.3-9.

A. Benzene Railcar Fugitive Emissions During Unloading Are Significant and Unmitigated

The EIR did not include benzene emissions from railcar fugitive emissions during unloading in the health risk assessment. I estimated these emissions for the entire time that the railcars would be within the Refinery boundary in my 4/4/16 comments.[9]

As I previously explained, benzene has been reported in Bakken crude oils at up to 7 wt. %. Assuming that 80% of the VOCs are ROG, benzene emissions could be up to 70 lb/day or 13 ton/yr during railcar unloading.[10] These revised benzene emissions are substantially higher than those included in the revised health risk assessment from conventional fugitive sources (such as valves and pumps): 0.062 lb/day and 0.01 ton/yr.[11]

I revised the risk calculations in Exhibit 2a to include benzene emissions from railcars during unloading alone. My calculations are summarized in Table 1 and documented in Exhibit 2a (Tab: Rev. Calcs).

[9] 4/4/16 Fox Comments, Comment III.

[10] Benzene weight percent (7%) is reported based on VOC emissions. ROG emissions are a subset of VOC emissions. Conservatively assuming that 80% of VOC is ROG, the maximum benzene emissions = [399 lb ROG/visit)(2 visit/day)/(0.8 ROG/VOC)] × (0.07 benzene/VOC)= **69.83 lb/day**.

[11] Amy Million, City of Benicia, Email to Rachael Koss, Adams Broadwell Joseph & Cardozo, Re: Modeling Files for Valero CBR - Adams Broadwell Request, February 2, 2016, 1:24 pm. ("Some files have been sent to you via the YouSendIt File Delivery Service. Download the file -... Updated Refinery HRA Calculation Jan 2016.xlsx...") (Exhibit 6 to 4/4/16 Fox Comments.) *See* also summary in Exhibit 1b, Tab Rev. Calcs.

Table 1: Revised Health Risk Calculations for Emissions of Benzene from Railcar Fugitive Emissions During Unloading.

	Benzene Emissions (lb/day)	Chronic Hazard Index	Acute Hazard Index	Cancer Risk	Revised Benzene Emissions (lb/day)	Chronic Hazard Index	Acute Hazard Index	Cancer Risk
	EIR Health Risks Benzene				Revised Health Risks Benzene			
Resident	6.17E-02	0.00	0.00	9.42E-09	69.83	0.0	**4.2**	**1.07E-05**
Worker	6.17E-02	0.00	0.08	2.18E-08	69.83	0.9	**89.8**	**2.47E-05**
Daycare	6.17E-02	0.00	0.00	3.87E-09	69.83	0.0	0.1	**4.37E-06**
Elementary School	6.17E-02	0.00	0.00	3.87E-09	69.83	0.1	0.5	**4.37E-06**
	EIR Health Risks All TACs				Modified Health Risks All TACs*			
Resident		0.00	0.01	2.20E-06		0.0	**4.2**	**1.28E-05**
Worker		0.02	0.16	7.40E-06		0.9	**89.9**	**3.20E-05**
Daycare		0.00	0.00	2.52E-07		0.0	0.1	**4.62E-06**
Elementary School		0.00	0.00	2.23E-07		0.1	**0.5**	**4.59E-06**

*Assumes all emissions are estimated correctly except benzene. Highlighted/**bolded** cells indicate significant health risks (acute and chronic hazard index equal to or greater than 1.0; cancer risk equal to or greater than 1.0E-05.)

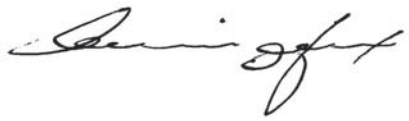
This table shows that benzene emissions from railcar unloading fugitive emissions under the control of Valero at the unloading racks result in significant cancer risk and acute health impacts at the MEIR (nearest resident) and MEIW (nearest worker). When emissions of all other TACs are included, health risks are even higher. Thus, Valero owned and operated facilities, the unloading racks, pose significant health risks, and result in significant health impacts, for nearby residents and workers.

II. OTHER UNLOADING EMISSIONS

Other emission sources during unloading include: (1) fugitive component ROG and TAC emissions on equipment that connects the unloading rack to the storage tanks -- pumps, valves, flanges, connectors, and pressure relief valves; (2) coupling and uncoupling emissions when the railcars are connected and disconnected to/from the unloading racks; (3) evaporation of crude oil drips, drops, and larger spills during the coupling/decoupling process; and (4) sump emissions. The DEIR included pumps, valves, flanges, connectors, and pressure relief valves on facilities used to transport the

crude oil to storage tanks[12] but not the other sources of loading rack emissions, including coupling/decoupling emissions; spills; and sump emissions. Thus, the EIR fails as an information document as it did not include all ROG and TAC emission sources associated with unloading.

In sum, on-site ROG and benzene emissions from Valero owned and controlled facilities and operations, the loading racks and unloading of railcars, would result in significant air quality and public health impacts. These impacts were not disclosed or mitigated in the EIR.



Phyllis Fox

[12] DEIR, Table 3-4 and pdf 1179.

Ex. 1a

ARRIVING RAIL CARS					Using Oil & Gas Production Emission Factors		Using Marketing Terminal Emission Factors	
Component	Service	Equipment Count per Railcar	Number of Railcars	Loading Rack (hrs)	Emission Factor (kg/hr/comp)	ROG Emissions (lb/visit)	Emission Factor (kg/hr/comp)	ROG Emissions (lb/visit)
Pressure Relief Valve	Gas	2	50	6.1	0.8316	895	0.138	148
Valve	Light Crude Oil	1	50	6.1	0.0707	38	0.023	12
Valve	Gas	3	50	6.1	0.1386	224	0.023	37
Connectors	Gas	9	50	6.1	0.0259	125	0.034	165
Connectors	Light Crude Oil	2	50	6.1	0.0234	25	0.034	37
Total Railcar Fugitive ROG Emissions at Loading Racks						**1307**		**399**

(1) Emission factors from CARB 1999, Table IV-2e for >/= 10,000 ppmv.

(2) Calculations assume 80% of VOCs are ROG.

(3) The RDEIR indicates that the maximum pumping rate is 4,000 gpm. RDEIR, p. 42 (pdf 327).
Thus, the time to unload 35,000 bbl/day (1 50-car unit train) = 35,000 bbl x 42 gal/bbl/4,000 gal/min = 367.5 min = **6.13 hrs.**

Exh. 2a

	Benzene Emissions (lb/day)	Chronic Hazard Index	Acute Hazard Index	Cancer Risk	Revised Benzene Emissions (lb/day)	Chronic Hazard Index	Acute Hazard Index	Cancer Risk
	EIR Health Risks Benzene				Revised Health Risks Benzene			
Resident	6.17E-02	0.00	0.00	9.42E-09	69.83	0.0	**4.2**	**1.07E-05**
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* Assumes all emissions are estimated correctly except benzene

Highlighted cells: significant health risks (acute and chronic hazard index equal to or greater than 1.0; cancer risk equal to or greater than 1.0E-05