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September 21, 2016

**VIA ELECTRONIC MAIL AND OVERNIGHT MAIL**

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**Re: Summary of Comments on the Final Environmental Impact Report for the Phillips 66 Company Rail Spur Extension Project**

Dear Honorable Members of the San Luis Obispo County Planning Commission and Ms. Hostetter:

We are writing on behalf of Safe Fuel and Energy Resources California (“SAFER California”), Ian Ostrov, and Gene Sewall regarding the Planning Commission’s September 22, 2016 hearing on the Phillips 66 Rail Spur Extension Project (“Project”). The Commission will consider whether to approve or deny the Project, or whether to grant Phillips 66’s request for a continuance until March 2017. We support staff’s recommendation to deny Phillips 66’s request for a continuance; although this issue is now moot because the STB issued its decision on the preemption issue with regard to the Valero crude by rail project. We also remain in agreement with planning staff’s original recommendation for denial of the

3017-035ieh

September 21, 2016

Page 2

Project. In fact, as we have explained in previous comments, the Commission must deny the Project outright for the several reasons.

*First*, the County has completely failed to address highly significant on-site fugitive VOC (or ROG) emissions, which result in significant health risks even with the Reduced Rail Alternative. We commented on this issue in our March 9 comments; however, the new Staff Report does not include any additional measures that would mitigate the fugitive VOC emissions on-site. We therefore submit further evidence of the health impacts from on-site fugitive VOC emissions with this letter, with the assistance of Petra Pless, D.Env.<sup>1</sup> Indeed, Dr. Pless demonstrates in her comments that that health risks resulting from *on-site* emissions of toxic air contaminants (“TACs”) for the Reduced Rail Alternative are significant even with mitigation, contrary to the County’s CEQA findings for TAC emissions from locomotives. Please see Dr. Pless’ comments for further details.

*Second*, the new Staff Report indicates that any mitigation measures or conditions of approval for mainline impacts are not viable due to federal preemption, and therefore would not be applicable to the Project. However, as we have previously commented, the County’s determination that federal preemption precludes it from imposing any measures to mitigate mainline impacts is not legally supported. Indeed, the STB recently issued a decision *denying* Valero’s request for a declaratory order finding that the City of Benicia is federally preempted from denying Valero’s request for a permit for its crude by rail project.<sup>2</sup> The STB found that Valero, like Phillips 66, is not a “rail carrier” and therefore Benicia’s decision to deny Valero’s permit would not be preempted under 49 U.S.C. § 10501. On September 20, Benicia’s City Council voted unanimously to deny Valero’s permit.

The STB’s decision also provides guidance on whether certain mitigation measures could run afoul of federal preemption laws. The STB clarified that any measures that would “unreasonably interfere” with Union Pacific’s (“UP”) operations would be preempted. We addressed this issue in our RDEIR and FEIR comments. We stated then, and reiterate here again, that requiring certain contractual arrangements between Phillips 66 and UP as a condition of Phillips 66’s

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<sup>1</sup> See Letter from Petra Pless, to Laura Horton re: Supplemental Comments Regarding Health Risks Resulting from On-site Toxic Air Contaminant Emissions Associated with Phillips 66 Company Rail Spur Extension and Crude Unloading Project, Sept. 20, 2016, **Attachment A**.

<sup>2</sup> See Surface Transportation Board Decision, Docket No. FD 36036, September 20, 2016, **Attachment B**.

permit would not unreasonably interfere with UP's operations. For example, a permit condition requiring Phillips 66 to source feedstock via Tier 4 locomotives does not regulate UP's interstate operations, should those arrangements be made prior to the construction of the facility. Only after the facility is constructed and operations are underway does the restriction on the County's ability to regulate UP's activities come into play, according to the STB. Likewise, a condition requiring Phillips 66 to contribute to off-site mitigation fee programs in uprail communities in no way regulates UP's operations. Should Phillips 66 be unwilling or unable to secure any of these measures, then the Project would simply fail to move forward, which would not unreasonably interfere with UP's operations because UP would continue to operate as it normally does. In light of STB's clarification, the County should revise its list of conditions of approval and mitigation measures to require Phillips 66 to mitigate mainline impacts with measures that do not unreasonably interfere with UP's operations. Otherwise, the County has utterly failed to require available, feasible and enforceable measures to mitigate the Project's highly significant mainline impacts, in violation of CEQA.

*Third*, the complete reversal in the new Staff Report from staff's original findings for denial regarding consistency with various land use plans, laws, and policies covering the Project area is completely unsupported. The Project's impacts in several resource areas both on- and off- site remain highly significant, threatening the health of the public, air and water quality, and sensitive species and coastal habitat, among other resources. Therefore, the Project is inconsistent with the County's General Plan, the Coastal Zone Land Use Ordinance, the Local Coastal Plan, the South County Coastal Area Plan, and the Coastal Act.

*Fourth*, the County has failed to respond to our remaining comments on the EIR's many deficiencies, and therefore our conclusions in those comments remain valid. Our previous comments discuss the following issues, which must be, but have not yet been, addressed:

- The FEIR unlawfully piecemeals environmental review of the Project from review of the San Maria Refinery Throughput Increase Project and the Rodeo Refinery Propane Recovery Project. These three components of Phillips 66's plan to import and refine North American crude are inextricably linked and should have been evaluated as a single project under CEQA.

- The FEIR substantially underestimates the Project's operational off-site and on-site emissions of criteria pollutants and precursors, including reactive organic gases ("ROG") and nitrogen oxides ("NOx") (ozone precursors) and diesel particulate matter ("DPM").
- The FEIR fails to adequately disclose, analyze, and mitigate the Project's highly significant health risks off-site and on-site.
- The FEIR fails to adequately disclose, analyze, and mitigate the Project's significant impacts due to changes in crude slate.
- The FEIR fails to evaluate significant on-site hazards from the Project's increased potential for catastrophic releases due to higher corrosivity of Canadian tar sands crudes compared to existing crude slate.
- The FEIR fails to adequately consider and recommend feasible and available options to mitigate highly significant off-site hazards.
- The FEIR fails to evaluate all of the Reduced Rail Alternative's significant impacts with respect to air quality, health risks, and greenhouse gas emissions. Approval of the Reduced Rail Alternative would not reduce the Project's impacts to less than significant levels.
- The FEIR fails to properly establish existing conditions for biological resources, which is critical to adequately analyzing the Project's significant impacts on those resources.
- The FEIR fails to adequately disclose, analyze, and mitigate the Project's significant impacts to biological resources, particularly rare plants, burrowing owls, legless lizards, coast horn lizards, American badger, and other sensitive species.
- The FEIR fails to include a mitigation management plan or a funding mechanism that would ensure the long-term success of mitigation land.
- The Project would permanently destroy over 20 acres (and likely much more) of Environmentally Sensitive Habitat Area.

September 21, 2016

Page 5

- Mitigation measures evaluated in the FEIR are unlawfully deferred, vague, unenforceable, or otherwise inadequate.

For these reasons, we urge the Commission to deny this Project based on the original findings for denial prepared by staff, as well as these and other public comments. Until the violations, flaws, and omissions described in these documents are resolved, the County may not lawfully approve the Project.

Thank you for your attention to this important matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Laura Horton", written in a cursive style.

Laura E. Horton

Attachments

LEH:ieh

# Attachment A

**Pless Environmental, Inc.**

440 Nova Albion Way, Suite 2  
San Rafael, CA 94903  
(415) 492-2131 voice  
(815) 572-8600 fax

September 20, 2016

*Via Email*

Laura Horton  
Adams Broadwell Joseph & Cardozo  
601 Gateway Boulevard, Suite 1000  
South San Francisco, CA 94080-7037  
*lhorton@adamsbroadwell.com*

*Re: Supplemental Comments Regarding Health Risks Resulting from On-site Toxic Air Contaminant Emissions Associated with Phillips 66 Company Rail Spur Extension and Crude Unloading Project*

Dear Ms. Horton,

This letter supplements my February 25, 2016 comment letter<sup>1</sup> on the Final Environmental Impact Report ("FEIR") for the Rail Spur Extension and Crude Unloading Project ("Project") proposed by Phillips 66 ("Applicant") at its Santa Maria Refinery ("Refinery") in San Luis Obispo County ("County"). Specifically, my comments demonstrate that health risks resulting from *on-site* emissions of toxic air contaminants ("TACs") for the 3-train-per-week alternative proposed for approval by the County Planning Commission at the upcoming September 22, 2016 hearing are significant including mitigation,<sup>2</sup> contrary to the County's CEQA findings for TAC emissions from locomotives.<sup>3</sup>

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<sup>1</sup> Petra Pless, Pless Environmental Inc., Letter to Laura Horton, Adams Broadwell Joseph & Cardozo, Re: Review of Phillips 66 Company Rail Spur Extension and Crude Unloading Project Final Environmental Impact Report and Vertical Coastal Access Project Assessment, February 25, 2016; available at:

[http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project+Comments+2+\(PostEIR\)/Post+EIR+Comments/Letter+from+Adams+Broadwell+Joseph+and+Cardozo+Attachment+B+03\\_09\\_2016.pdf](http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project+Comments+2+(PostEIR)/Post+EIR+Comments/Letter+from+Adams+Broadwell+Joseph+and+Cardozo+Attachment+B+03_09_2016.pdf), accessed September 20, 2016.

<sup>2</sup> San Luis Obispo County, Department of Planning and Building, Re: Continued item - Phillips 66 Development Plan/Coastal Development Permit / DRC2012-00095, September 22, 2016; available at: <http://agenda.slocounty.ca.gov/agenda/sanluisobispo/Proposal.html?select=6442>, accessed September 20, 2016.

<sup>3</sup> *Ibid*, Exhibit C, pp. 35-36 ("Mitigation measures would reduce the severity of impacts to less than significant, Impacts associated with the 3 trains per week EIR alternative in the vicinity of the SMR would be less than significant with mitigation (Class II)").

## **Incremental Cancer Risks from Onsite Fugitive Toxic Air Contaminant Emissions from Railcars Are Significant for the 3-Train-per-week Alternative Proposed for Approval**

The railcars used to transport crude oil and the railcar unloading rack for the Project would result in fugitive emissions of volatile organic compounds (“VOCs”)<sup>4</sup> from leaking valves, flanges, pump seals, process drains, fittings, and hatches, and from pressure relief vents (“PRVs”) and unloading carbon canisters.<sup>5</sup> These fugitive VOC emissions contain significant amounts of TACs such as benzene, a potent carcinogen. My comments below demonstrate that the Final EIR substantially underestimates incremental cancer risks from *on-site* emissions of TACs for the 5-train-per-week alternative and that health risks remain significant for the 3-train-per-week alternative proposed for approval regardless of proposed Conditions of Approval. My comments are based on the results presented in the Final EIR, Appendix B.1 *Air Emission Calculations* and Appendix B.2 *Health Risk Assessment Protocol and Report* as well as the associated spreadsheets and modeling files provided by the County’s consulting firm Marine Research Specialists (“MRS”).<sup>6</sup>

### *a) The Final EIR Underestimates Fugitive Emissions of Volatile Organic Compounds and Toxic Air Contaminants from Rail Cars and Rail Car Unloading*

The Final EIR, Appx. B.1, estimates **0.026 tons/year**, or **51.8 lbs/year**,<sup>7</sup> fugitive VOC emissions from leaking components on railcars and **1.01 tons/year**, or **2,021.4 lbs/year**,<sup>8</sup> total fugitive VOC emissions associated with crude oil unloading, *i.e.*, combined emissions from the rail cars, the rail unloading terminal, and unloading carbon canisters, for the 5-train-per-week alternative.<sup>9</sup> For its health risk assessment, the Final EIR assumes a benzene content in these crude oil fugitive VOC emissions of 2.2% based on California Air Resources Board (“CARB”) speciation profile 297<sup>10</sup> and

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<sup>4</sup> VOCs are organic chemicals that have a high vapor pressure at ordinary room temperature. Their high vapor pressure results from a low boiling point, which causes large numbers of molecules to evaporate or sublime from the liquid or solid form of the compound and enter the surrounding air, a trait known as volatility. Some VOCs can react with nitrogen oxides or with ozone to produce new oxidation products and secondary aerosols. These VOCs are termed reactive organic gases (“ROG”).

<sup>5</sup> See, for example, Final EIR, Appx. B.1, p. B.1-7.

<sup>6</sup> MRS spreadsheets *Air Emissions MRS versionR16.xlsx* and *SMR\_HARP2\_11\_23\_2015.zip*.

<sup>7</sup> (MRS spreadsheet *Air Emissions MRS versionR16.xlsx*, VOC Fugitive: 0.0259 tons/year) × (2,000 lbs/ton) = 51.8 lbs/year.

<sup>8</sup> (MRS spreadsheet *Air Emissions MRS versionR16.xlsx*, VOC Fugitive: 1.011 tons/year) × (2000 lbs/ton) = 2021.4 lbs/year.

<sup>9</sup> FEIR, Appx. B.1, p. B.1-7.

<sup>10</sup> MRS, *SMR\_HARP2\_11\_23\_2015.zip\SMR\_Calcs\Harp2 Data Calcs Onsite Rail.xlsx*, Worksheet: *Calcs* (CARB speciation factor for benzene, fraction of VOC: 0.021888).

calculates benzene emissions from fugitive components at **44.08 lbs/year**;<sup>11</sup> the Final EIR used this value as the input for modeling long-term health risks with HARP2.<sup>12</sup>

According to Dr. Phyllis Fox's March 1, 2016 comment letter, the FEIR, due to numerous errors and omissions, by far underestimates fugitive VOC emissions from railcars.<sup>13</sup> Dr. Fox estimates fugitive VOC emissions from railcars alone while on site (not accounting for the fugitive components at the unloading facility) at **between 790 and 2,587 lbs per train visit**<sup>14</sup> assuming a train would be on site for 11.5 hours. Based on these emission rates, Dr. Fox estimates fugitive VOC emission at **between 42 and 336 tons/year for the 5-train-per-week alternative and between 62 and 202 tons/year for the 3-train-per-week alternative**. Dr. Fox's estimates of fugitive VOC emissions from rail cars on site are several orders of magnitude higher than those estimated by the Final EIR (**0.026 tons/year**).

*b) Revised Health Risk Assessment Based on Dr. Fox's Emission Estimates for Fugitive VOC Emissions from Rail Cars*

I prepared a revised health risk assessment for Project TAC emissions based on Dr. Fox's estimates of fugitive VOC emissions from rail cars and the modeling files provided by MRS and otherwise using the same methodology and assumptions as the Final EIR.

Specifically, I identified the maximum 5-year average default concentration of benzene (based on an emission rate of 1 gram per second ("g/s")) resulting from fugitive emissions from rail cars and rail car unloading (emission source 501) at a sensitive receptor modeled by MRS with AERMOD. The maximum benzene default concentration, **1.1437 µg/m<sup>3</sup>** for an emission rate of 1 g/s, occurs at a sensitive receptor northeast of the Refinery (UTM 721168.4, 3880359), as shown in the figure below.<sup>15</sup>

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<sup>11</sup> MRS, HARP2\_11\_23\_2015.zip\SMR\_Rail\data\SMR\_RAIL\_IMPORTEMS.csv, Worksheet: SMR\_RAIL\_IMPORTEMS (for source 501: cells G:936); also MRS, HARP2\_11\_23\_2015.zip\SMR\_Calcs\ProjectSummaryReport SMR\_Rail.txt.

<sup>12</sup> Final EIR, Appx. B.2, p. B.2-5 ("The model used is HARP2 version 15197. AERMOD was run from within the HARP2 model.") and p. B.2-7 ("The impacts were determined using the most recent version of the HARP2 model (15197) along with the AERMOD dispersion modeling software.")

<sup>13</sup> Phyllis Fox, Comments on Final Environmental Impact Report for the Santa Maria Rail Spur Project, Nipomo, California, March 1, 2016, Comment II ("Fox Final EIR Comments"); [http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project+Comments+2+\(PostEIR\)/Post+EIR+Comments/Letter+from+Adams+Broadwell+Joseph+and+Cardozo++Attachment+A+03\\_09\\_2016.pdf](http://www.slocounty.ca.gov/Assets/PL/Santa+Maria+Refinery+Rail+Project+Comments+2+(PostEIR)/Post+EIR+Comments/Letter+from+Adams+Broadwell+Joseph+and+Cardozo++Attachment+A+03_09_2016.pdf). Dr. Fox (personal communication September 20, 2016) calculates "VOC" emissions but the comments refer to "ROG" emissions, rather than "VOC" emissions, in order to be consistent with the Final EIR's terminology.

<sup>14</sup> Fox Final EIR Comments, p. 22.

<sup>15</sup> See MRS, SMR\_HARP2\_11\_23\_2015.zip\SMR\_Rail\plt\PERIOD501.PLT.

**Location of maximally exposed sensitive receptor for cancer risk**



I then multiplied the modeled default concentration for benzene by the annual average hourly fugitive benzene emission rate from rail cars based on a) the Final EIR's emission estimates (0.000634 g/s benzene<sup>16</sup>) and b) Dr. Fox's emission estimates (0.307931–0.513219 g/s benzene<sup>17</sup> for the 3-train-per-week alternative and 1.008377–1.680629 g/s benzene<sup>18</sup> for the 5-train-per-week alternatives, respectively). I then calculated the 30-year cancer risk for the maximum exposed individual receptor

<sup>16</sup> (MRS, HARP2\_11\_23\_2015.zip\SMR\_Rail\data\SMR\_RAIL\_IMPORTEMS.csv, Worksheet: SMR\_RAIL\_IMPORTEMS for source 501: cell G:935 = 44.08 lbs/year benzene) / (365 days/year) / (24 hours/day) / (3,600 s/hour) × (453.6 g/lb) = **0.000634 g/s benzene.**

<sup>17</sup> (790 lb VOC/visit) × (3 visits/week) × (52 weeks/year) / (365 days/year) / (24 hours/day) / (3,600 s/hour) × (453.6 g/lb) × (0.021888 benzene/VOC) = **0.307931 g/s benzene;**  
(790 lb VOC/visit) × (3 visits/week) × (52 weeks/year) / (365 days/year) / (24 hours/day) / (3,600 s/hour) × (453.6 g/lb) × (0.021888 benzene/VOC) = **0.513219 g/s benzene.**

<sup>18</sup> (2,587 lb VOC/visit) × (5 visits/week) × (52 weeks/year) / (365 days/year) / (24 hours/day) / (3,600 s/hour) × (453.6 g/lb) × (0.021888 benzene/VOC) = **1.008377 g/s benzene;**  
(2,587 lb VOC/visit) × (5 visits/week) × (52 weeks/year) / (365 days/year) / (24 hours/day) / (3,600 s/hour) × (453.6 g/lb) × (0.021888 benzene/VOC) = **1.680629 g/s benzene.**

(“MEIR”) following the health risk assessment methodology described in the 2015 guidelines published by the Office of Environmental Health Hazard Assessment (“OEHHA”)<sup>19</sup> – which are incorporated into the HARP2 model used by the Final EIR – based on the benzene content in fugitive VOC emissions of 2.2% and using a cancer potency factor for benzene of 0.1.<sup>20</sup> Table 1 summarizes the resulting incremental cancer risk due to benzene emissions from rail cars at the MEIR based on the rail car emission rates from the Final EIR and based on Dr. Fox’s emission rates for rail cars assuming 5, 3, and 1 trains per week. Detailed calculations are provided in attached Tables A-1a through A-1g.

**Table 1: Cancer risk at MEIR due to fugitive benzene emissions from on-site rail cars**

	Benzene emission rate			Cancer risk at MEIR (mean)
	(lbs/visit)	(lbs/year)	(g/s)	
Final EIR 5-Train/week Alternative		44.08 <sup>a</sup>	0.005032 <sup>b</sup>	0.3 in one million <sup>c</sup>
Revised 5-Train/week Alternative	790–2,587 <sup>d</sup>	205,400–672,620 <sup>e</sup>	1.008377–1.680629 <sup>b</sup>	253.3–829.5 in one million <sup>f</sup>
Revised 3-Train/week Alternative		123,240–403,572 <sup>g</sup>	0.307931–0.513219 <sup>b</sup>	152.0–497.7 in one million <sup>h</sup>
Revised 1-Train/week Alternative		41,080–134,524	0.102644–0.336126	50.7–165.9 in one million <sup>i</sup>

a MRS, HARP2\_11\_23\_2015.zip\SMR\data\SMR\_RAIL\_IMPORTEMS.csv, Worksheet: SMR\_RAIL\_IMPORTEMS (for source 501: cell G:936)

b  $(g/s) = (lbs/year) / (8,760 \text{ hours/year}) / (3,600 \text{ s/hour})$

c See attached Table A-1a

d Fox Final EIR Comments, p. 22

e  $(lbs/year) = (lbs/train \text{ visit}) \times (52 \text{ weeks/year}) \times (5 \text{ train visits/week})$

f See attached Tables A-1b and A-1c

g  $(lbs/year) = (lbs/train \text{ visit}) \times (52 \text{ weeks/year}) \times (3 \text{ train visits/week})$

h See attached Tables A-1d and A-1e

i See attached Tables A-1f and A-1g

As shown, the EIR attributes a cancer risk of **0.3 in one million** to fugitive benzene emissions from rail cars for the 5-train-per-week alternative. Based on Dr. Fox’s VOC emission estimates, cancer risks attributable to fugitive rail car benzene emissions range **between 253 in one million and 830 in one million** for the 5-train-per-week alternative, far above the significance threshold of 10 in one million established by the San Luis Obispo County Air Pollution Control District’s CEQA Air Quality Handbook and in Rule 219, *Toxics New Source Review*.<sup>21</sup> For the 3-train-per-week alternative, these risks are three fifths lower – **between 152 in one million and 498 in one million** – but still far above the significance threshold for cancer risks of 10 in one million. Even if crude oil deliveries were reduced to only one (1) train per week, incremental cancer

<sup>19</sup> OEHHA, Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments, February 2015; available at: [http://oehha.ca.gov/air/hot\\_spots/2015/2015GuidanceManual.pdf](http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf), accessed September 20, 2016.

<sup>20</sup> See MRS, HARP2\_11\_23\_2015.zip\SMR\hra\POLDB.csv.

<sup>21</sup> Final EIR, p. 4.3-68.

risks – between 51 and 166 in one million – would remain far above the significance threshold of 10 in one million.

Thus, *on-site* fugitive emissions from railcars alone result in significant incremental cancer risks at the maximally exposed individual receptor for both the 5-train-per-week and the 3-train-per-week alternative. These estimates do not include benzene emissions from fugitive components on the loading rack or pipeline connecting the rail terminal and storage tanks and are not addressed by any of the proposed Conditions of Approval. Further, these cancer risk estimates are in addition to the substantial cancer risks from on-site locomotive emissions of diesel particulate matter.

### **Feasible Mitigation Measures to Reduce Fugitive Emissions of Toxic Air Contaminants**

Dr. Fox proposed several additional feasible mitigation measures that could reduce fugitive emissions from rail cars, including:

- Replace all non-closing pressure relief devices, such as rupture discs, rupture pins, or other one-time-use pressure relief device with standard PRVs;
- All tank car hatches should be closed and sealed during loading operations;
- Require the use of pressure tank cars, such as the Tesoro DOT-120 design;
- If pressure tank cars are not selected, require that railcars be operated with an inert gas headspace, such as nitrogen rather than ambient air;
- Implement LDAR program for all on-site railcars during railyard idling and unloading.<sup>22</sup>

In addition, Dr. Fox proposed the following mitigation measure for the loading rack and pipeline:

- Require the use of zero-leak fugitive components at the rail terminal and on the pipeline connecting the rail terminal and storage tanks.<sup>23</sup>

The proposed Conditions of Approval incorporate none of these feasible mitigation measures. While their implementation would substantially reduce TAC emissions, and therefore should be required, they are unlikely to reduce the incremental cancer risks from rail cars to a less-than-significant level.

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<sup>22</sup> Fox Final EIR Comments, pp. 28-29.

<sup>23</sup> *Ibid.*

## Conclusion

Contrary to the County's finding, cancer risks resulting from operational emissions of TACs would be significant for the 3-train-per-week alternative proposed for approval.

Please call (415) 492-2131 or e-mail at [petra.pless@gmail.com](mailto:petra.pless@gmail.com) if you have any questions about the comments in this letter. Copies of cited document are available upon request.

Best regards,

A handwritten signature in black ink, appearing to read "Petra Pless". The signature is stylized with a large, sweeping initial "P" and a long, trailing flourish.

Petra Pless, D.Env.

**Table A-1a: Incremental Cancer Risk from Rail Car Fugitive Benzene Emissions**

**Final EIR**

$Dose_{air} = C_{air} \times \{BR/BW\} \times A \times EF \times 10E-6$

where

$Dose_{air}$  = dose through inhalation (see table below) (mg/kg/day)<sup>-1</sup>

$C_{air}$  = concentration in air (see table below) 7.25E-04 (μg/m<sup>3</sup>)

{BR/BW} = breathing rate normalized to body weight (see table below) (L/kg/day)

A = inhalation absorption factor 1 (unitless)

EF = exposure frequency 0.96 (unitless)

10<sup>-6</sup> = microgram/liter to milligram/cubic meter conversion

**Default Values**

= (default concentration) x (g/s)

1

for resident: 350 days/365 days

**1.1437** Default concentration for 1 g/s at max sensitive receptor from PERIOD501.PLT

**Emission Rates**

**44.08** Benzene emission rate EIR (lb/year)

0.005032 Benzene emission rate EIR (lb/hour) = (lb/year)/(8760 hours/year)

**0.000634** Benzene emission rate EIR (g/s) = (lb/hour)(453.6 g/lb)/(3600 s/hour)

$Cancer\ risk = Dose_{air} \times CPF \times ASF \times ED/AT \times FAH$

(unitless)

where

CPF = cancer potency factor 0.1 (unitless)

ASF = age sensitivity factor (see table below) (unitless)

ED = exposure duration 30 (years)

AT = averaging time 70 (years)

FAH = fraction of time spent at home (see table below) (unitless)

residential: 30 years (range 9 to 70 years)

From EIR			
		CARB Spec Factor, frac of TOC	CARB Spec Factor, frac of VOC
Crude Oil Fugitive Emissions			
Based on CARB profile 297			
<b>Pollutant Name</b>	<b>Pollutant ID #</b>		
Benzene	71432	0.024	<b>0.021888</b>
Weight fract ROC/THC gas from crude			0.912

Risk Year	Period (years)	Age Sensitivity Factor (-)	Fraction of Time at Home (-)	Mean {BR/BW} (L/kg/day)	95th percentile {BR/BW} (L/kg/day)	Dose <sub>air</sub> (mean) (mg/kg/day) <sup>-1</sup>	Dose <sub>air</sub> (95th percentile) (mg/kg/day) <sup>-1</sup>	Cancer Risk (mean)	Cancer Risk (95th percentile)
3rd trimester	0.25	10	0.85	225	361	1.56E-07	2.51E-07	5.71E-08	9.15E-08
0<1	1	10	0.85	658	1090	4.58E-07	7.58E-07	1.67E-07	2.76E-07
1<2	1	3	0.85	658	1090	4.58E-07	7.58E-07	5.00E-08	8.28E-08
2<9	7	3	0.72	535	861	3.72E-07	5.99E-07	3.44E-08	5.54E-08
2<16	14	3	0.72	452	745	3.14E-07	5.18E-07	2.91E-08	4.80E-08
9<16	7	3							
16<30	14	1	0.73	210	335	1.46E-07	2.33E-07	4.57E-09	7.29E-09
16<70	54	1	0.73	185	290	1.29E-07	2.02E-07	4.02E-09	6.31E-09
<b>Total for 9-year HRA</b>	<b>9.25</b>					<b>Total for 9-year HRA</b>		<b>3.08E-07</b>	<b>5.06E-07</b>
<b>Total for 30-year HRA</b>	<b>30.25</b>					<b>Total for 30-year HRA</b>		<b>3.13E-07</b>	<b>5.14E-07</b>
<b>Total for 70-year HRA</b>	<b>84.25</b>					<b>Total for 70-year HRA</b>		<b>3.41E-07</b>	<b>5.60E-07</b>

	(in one million)	(in one million)
<b>Total for 9-year HRA</b>	<b>0.3</b>	<b>0.5</b>
<b>Total for 30-year HRA</b>	<b>0.3</b>	<b>0.5</b>
<b>Total for 70-year HRA</b>	<b>0.3</b>	<b>0.6</b>

**Table A-1b: Incremental Cancer Risk from Rail Car Fugitive Benzene Emissions**

**Fox (790 lbs/visit, 5 trains/week)**

$Dose_{air} = C_{air} \times \{BR/BW\} \times A \times EF \times 10E-6$

where

$Dose_{air}$  = dose through inhalation (see table below) (mg/kg/day)<sup>-1</sup>

$C_{air}$  = concentration in air (see table below) (5.87E-01) (µg/m<sup>3</sup>)

{BR/BW} = breathing rate normalized to body weight (see table below) (L/kg/day)

A = inhalation absorption factor (1) (unitless)

EF = exposure frequency (0.96) (unitless)

10<sup>-6</sup> = microgram/liter to milligram/cubic meter conversion

Default Values

= (default concentration) x (g/s)

1  
for resident: 350 days/365 days

**1.1437** Default concentration for 1 g/s at max sensitive receptor from PERIOD501.PLT  
5 Visits/week

Emission Rates

**790** VOC emission rate Fox (lb/visit)

205,400 VOC emission rate Fox (lb/year) = (VOC lb/visit)(52 weeks/year)(# visits/year)

**0.513219** Benzene emission Rate Fox (g/s) = (lb/hour)(453.6 g/lb)/(3600 s/hour)

$Cancer\ risk = Dose_{air} \times CPF \times ASF \times ED/AT \times FAH$

where

CPF = cancer potency factor (0.1) (unitless)

ASF = age sensitivity factor (see table below) (unitless)

ED = exposure duration (30) (years)

AT = averaging time (70) (years)

FAH = fraction of time spent at home (see table below) (unitless)

residential: 30 years (range 9 to 70 years)

From EIR		CARB Spec Factor, frac of TOC	CARB Spec Factor, frac of VOC
Crude Oil Fugitive Emissions			
Based on CARB profile 297			
Pollutant Name	Pollutant ID #		
Benzene	71432	0.024	<b>0.021888</b>
Weight fract ROC/THC gas from crude			0.912

Risk Year	Period (years)	Age Sensitivity Factor (-)	Fraction of Time at Home (-)	Mean {BR/BW} (L/kg/day)	95th percentile {BR/BW} (L/kg/day)	Dose <sub>air</sub> (mean) (mg/kg/day) <sup>-1</sup>	Dose <sub>air</sub> (95th percentile) (mg/kg/day) <sup>-1</sup>	Cancer Risk (mean)	Cancer Risk (95th percentile)
3rd trimester	0.25	10	0.85	225	361	1.27E-04	2.03E-04	4.62E-05	7.41E-05
0<1	1	10	0.85	658	1090	3.70E-04	6.14E-04	1.35E-04	2.24E-04
1<2	1	3	0.85	658	1090	3.70E-04	6.14E-04	4.05E-05	6.70E-05
2<9	7	3	0.72	535	861	3.01E-04	4.85E-04	2.79E-05	4.49E-05
2<16	14	3	0.72	452	745	2.54E-04	4.19E-04	2.36E-05	3.88E-05
9<16	7	3							
16<30	14	1	0.73	210	335	1.18E-04	1.89E-04	3.70E-06	5.90E-06
16<70	54	1	0.73	185	290	1.04E-04	1.63E-04	3.26E-06	5.11E-06
<b>Total for 9-year HRA</b>	<b>9.25</b>					<b>Total for 9-year HRA</b>	<b>2.50E-04</b>	<b>4.10E-04</b>	
<b>Total for 30-year HRA</b>	<b>30.25</b>					<b>Total for 30-year HRA</b>	<b>2.53E-04</b>	<b>4.16E-04</b>	
<b>Total for 70-year HRA</b>	<b>84.25</b>					<b>Total for 70-year HRA</b>	<b>2.76E-04</b>	<b>4.54E-04</b>	

	(in one million)	(in one million)
<b>Total for 9-year HRA</b>	<b>249.6</b>	<b>409.8</b>
<b>Total for 30-year HRA</b>	<b>253.3</b>	<b>415.7</b>
<b>Total for 70-year HRA</b>	<b>276.4</b>	<b>453.7</b>

**Table A-1c: Incremental Cancer Risk from Rail Car Fugitive Benzene Emissions**

**Fox (2,587 lbs/visit, 5 trains/week)**

$Dose_{air} = C_{air} \times \{BR/BW\} \times A \times EF \times 10E-6$

where

$Dose_{air}$  = dose through inhalation (see table below) (mg/kg/day)<sup>-1</sup>

$C_{air}$  = concentration in air (see table below) (1.92E+00) (µg/m<sup>3</sup>)

{BR/BW} = breathing rate normalized to body weight (see table below) (L/kg/day)

A = inhalation absorption factor (1) (unitless)

EF = exposure frequency (0.96) (unitless)

10<sup>-6</sup> = microgram/liter to milligram/cubic meter conversion

Default Values

= (default concentration) x (g/s)

1

for resident: 350 days/365 days

**1.1437** Default concentration for 1 g/s at max sensitive receptor from PERIOD501.PLT  
5 Visits/week

Emission Rates

**2,587** VOC emission rate Fox (lb/visit)

672,620 VOC emission rate Fox (lb/year) = (VOC lb/visit)(52 weeks/year)(# visits/year)

**1.680629** Benzene emission Rate Fox (g/s) = (lb/hour)(453.6 g/lb)/(3600 s/hour)

$Cancer\ risk = Dose_{air} \times CPF \times ASF \times ED/AT \times FAH$

where

CPF = cancer potency factor (0.1) (unitless)

ASF = age sensitivity factor (see table below) (unitless)

ED = exposure duration (30) (years)

AT = averaging time (70) (years)

FAH = fraction of time spent at home (see table below) (unitless)

residential: 30 years (range 9 to 70 years)

From EIR		CARB Spec Factor, frac of TOC	CARB Spec Factor, frac of VOC
Crude Oil Fugitive Emissions			
Based on CARB profile 297			
Pollutant Name	Pollutant ID #		
Benzene	71432	0.024	<b>0.021888</b>
Weight fract ROC/THC gas from crude			0.912

Risk Year	Period (years)	Age Sensitivity Factor (-)	Fraction of Time at Home (-)	Mean {BR/BW} (L/kg/day)	95th percentile {BR/BW} (L/kg/day)	Dose <sub>air</sub> (mean) (mg/kg/day) <sup>-1</sup>	Dose <sub>air</sub> (95th percentile) (mg/kg/day) <sup>-1</sup>	Cancer Risk (mean)	Cancer Risk (95th percentile)
3rd trimester	0.25	10	0.85	225	361	4.15E-04	6.65E-04	1.51E-04	2.43E-04
0<1	1	10	0.85	658	1090	1.21E-03	2.01E-03	4.42E-04	7.33E-04
1<2	1	3	0.85	658	1090	1.21E-03	2.01E-03	1.33E-04	2.20E-04
2<9	7	3	0.72	535	861	9.86E-04	1.59E-03	9.13E-05	1.47E-04
2<16	14	3	0.72	452	745	8.33E-04	1.37E-03	7.71E-05	1.27E-04
9<16	7	3							
16<30	14	1	0.73	210	335	3.87E-04	6.17E-04	1.21E-05	1.93E-05
16<70	54	1	0.73	185	290	3.41E-04	5.35E-04	1.07E-05	1.67E-05
<b>Total for 9-year HRA</b>	<b>9.25</b>					<b>Total for 9-year HRA</b>	<b>8.17E-04</b>	<b>8.17E-04</b>	<b>1.34E-03</b>
<b>Total for 30-year HRA</b>	<b>30.25</b>					<b>Total for 30-year HRA</b>	<b>8.30E-04</b>	<b>8.30E-04</b>	<b>1.36E-03</b>
<b>Total for 70-year HRA</b>	<b>84.25</b>					<b>Total for 70-year HRA</b>	<b>9.05E-04</b>	<b>9.05E-04</b>	<b>1.49E-03</b>

	(in one million)	(in one million)
<b>Total for 9-year HRA</b>	<b>817.4</b>	<b>1341.9</b>
<b>Total for 30-year HRA</b>	<b>829.5</b>	<b>1361.2</b>
<b>Total for 70-year HRA</b>	<b>905.2</b>	<b>1485.7</b>

**Table A-1d: Incremental Cancer Risk from Rail Car Fugitive Benzene Emissions**

**Fox (790 lbs/visit, 3 trains/week)**

$Dose_{air} = C_{air} \times \{BR/BW\} \times A \times EF \times 10E-6$

where

$Dose_{air}$  = dose through inhalation (see table below) (mg/kg/day)<sup>-1</sup>

$C_{air}$  = concentration in air (see table below) (3.52E-01) (μg/m<sup>3</sup>)

{BR/BW} = breathing rate normalized to body weight (see table below) (L/kg/day)

A = inhalation absorption factor (1) (unitless)

EF = exposure frequency (0.96) (unitless)

10<sup>-6</sup> = microgram/liter to milligram/cubic meter conversion

Default Values

= (default concentration) x (g/s)

1

for resident: 350 days/365 days

**1.1437** Default concentration for 1 g/s at max sensitive receptor from PERIOD501.PLT  
**3** Visits/week

Emission Rates

**790** VOC emission rate Fox (lb/visit)

123,240 VOC emission rate Fox (lb/year) = (VOC lb/visit)(52 weeks/year)(# visits/year)

**0.307931** Benzene emission Rate Fox (g/s) = (lb/hour)(453.6 g/lb)/(3600 s/hour)

$Cancer\ risk = Dose_{air} \times CPF \times ASF \times ED/AT \times FAH$

(unitless)

where

CPF = cancer potency factor (0.1) (unitless)

ASF = age sensitivity factor (see table below) (unitless)

ED = exposure duration (30) (years)

AT = averaging time (70) (years)

FAH = fraction of time spent at home (see table below) (unitless)

residential: 30 years (range 9 to 70 years)

From EIR		CARB Spec Factor, frac of TOC	CARB Spec Factor, frac of VOC
Crude Oil Fugitive Emissions			
Based on CARB profile 297			
Pollutant Name	Pollutant ID #		
Benzene	71432	0.024	<b>0.021888</b>
Weight fract ROC/THC gas from crude			0.912

Risk Year	Period (years)	Age Sensitivity Factor (-)	Fraction of Time at Home (-)	Mean {BR/BW} (L/kg/day)	95th percentile {BR/BW} (L/kg/day)	Dose <sub>air</sub> (mean) (mg/kg/day) <sup>-1</sup>	Dose <sub>air</sub> (95th percentile) (mg/kg/day) <sup>-1</sup>	Cancer Risk (mean)	Cancer Risk (95th percentile)
3rd trimester	0.25	10	0.85	225	361	7.60E-05	1.22E-04	2.77E-05	4.45E-05
0<1	1	10	0.85	658	1090	2.22E-04	3.68E-04	8.10E-05	1.34E-04
1<2	1	3	0.85	658	1090	2.22E-04	3.68E-04	2.43E-05	4.02E-05
2<9	7	3	0.72	535	861	1.81E-04	2.91E-04	1.67E-05	2.69E-05
2<16	14	3	0.72	452	745	1.53E-04	2.52E-04	1.41E-05	2.33E-05
9<16	7	3							
16<30	14	1	0.73	210	335	7.09E-05	1.13E-04	2.22E-06	3.54E-06
16<70	54	1	0.73	185	290	6.25E-05	9.79E-05	1.95E-06	3.06E-06
<b>Total for 9-year HRA</b>	<b>9.25</b>					<b>Total for 9-year HRA</b>	<b>1.50E-04</b>	<b>1.50E-04</b>	<b>2.46E-04</b>
<b>Total for 30-year HRA</b>	<b>30.25</b>					<b>Total for 30-year HRA</b>	<b>1.52E-04</b>	<b>1.52E-04</b>	<b>2.49E-04</b>
<b>Total for 70-year HRA</b>	<b>84.25</b>					<b>Total for 70-year HRA</b>	<b>1.66E-04</b>	<b>1.66E-04</b>	<b>2.72E-04</b>

	(in one million)	(in one million)
<b>Total for 9-year HRA</b>	<b>149.8</b>	<b>245.9</b>
<b>Total for 30-year HRA</b>	<b>152.0</b>	<b>249.4</b>
<b>Total for 70-year HRA</b>	<b>165.9</b>	<b>272.2</b>

**Table A-1e: Incremental Cancer Risk from Rail Car Fugitive Benzene Emissions**

**Fox (2,587 lbs/visit, 3 trains/week)**

$Dose_{air} = C_{air} \times \{BR/BW\} \times A \times EF \times 10E-6$

where

$Dose_{air}$  = dose through inhalation (see table below) (mg/kg/day)<sup>-1</sup>

$C_{air}$  = concentration in air (see table below) (1.15E+00) (µg/m<sup>3</sup>)

{BR/BW} = breathing rate normalized to body weight (see table below) (L/kg/day)

A = inhalation absorption factor (1) (unitless)

EF = exposure frequency (0.96) (unitless)

10<sup>-6</sup> = microgram/liter to milligram/cubic meter conversion

**Default Values**

= (default concentration) x (g/s)

1

for resident: 350 days/365 days

**1.1437** Default concentration for 1 g/s at max sensitive receptor from PERIOD501.PLT  
**3** Visits/week

**Emission Rates**

**2,587** VOC emission rate Fox (lb/visit)

403,572 VOC emission rate Fox (lb/year) = (VOC lb/visit)(52 weeks/year)(# visits/year)

**1.008377** Benzene emission Rate Fox (g/s) = (lb/hour)(453.6 g/lb)/(3600 s/hour)

$Cancer\ risk = Dose_{air} \times CPF \times ASF \times ED/AT \times FAH$

where

CPF = cancer potency factor (0.1) (unitless)

ASF = age sensitivity factor (see table below) (unitless)

ED = exposure duration (30) (years)

AT = averaging time (70) (years)

FAH = fraction of time spent at home (see table below) (unitless)

residential: 30 years (range 9 to 70 years)

From EIR		CARB Spec Factor, frac of TOC	CARB Spec Factor, frac of VOC
Crude Oil Fugitive Emissions			
Based on CARB profile 297			
Pollutant Name	Pollutant ID #		
Benzene	71432	0.024	<b>0.021888</b>
Weight fract ROC/THC gas from crude			0.912

Risk Year	Period (years)	Age Sensitivity Factor (-)	Fraction of Time at Home (-)	Mean {BR/BW} (L/kg/day)	95th percentile {BR/BW} (L/kg/day)	Dose <sub>air</sub> (mean) (mg/kg/day) <sup>-1</sup>	Dose <sub>air</sub> (95th percentile) (mg/kg/day) <sup>-1</sup>	Cancer Risk (mean)	Cancer Risk (95th percentile)
3rd trimester	0.25	10	0.85	225	361	2.49E-04	3.99E-04	9.07E-05	1.46E-04
0<1	1	10	0.85	658	1090	7.28E-04	1.21E-03	2.65E-04	4.40E-04
1<2	1	3	0.85	658	1090	7.28E-04	1.21E-03	7.95E-05	1.32E-04
2<9	7	3	0.72	535	861	5.92E-04	9.52E-04	5.48E-05	8.81E-05
2<16	14	3	0.72	452	745	5.00E-04	8.24E-04	4.63E-05	7.63E-05
9<16	7	3							
16<30	14	1	0.73	210	335	2.32E-04	3.70E-04	7.27E-06	1.16E-05
16<70	54	1	0.73	185	290	2.05E-04	3.21E-04	6.40E-06	1.00E-05
<b>Total for 9-year HRA</b>	<b>9.25</b>					<b>Total for 9-year HRA</b>	<b>4.90E-04</b>	<b>4.90E-04</b>	<b>8.05E-04</b>
<b>Total for 30-year HRA</b>	<b>30.25</b>					<b>Total for 30-year HRA</b>	<b>4.98E-04</b>	<b>4.98E-04</b>	<b>8.17E-04</b>
<b>Total for 70-year HRA</b>	<b>84.25</b>					<b>Total for 70-year HRA</b>	<b>5.43E-04</b>	<b>5.43E-04</b>	<b>8.91E-04</b>

	(in one million)	(in one million)
<b>Total for 9-year HRA</b>	<b>490.4</b>	<b>805.1</b>
<b>Total for 30-year HRA</b>	<b>497.7</b>	<b>816.7</b>
<b>Total for 70-year HRA</b>	<b>543.1</b>	<b>891.4</b>

**Table A-1f: Incremental Cancer Risk from Rail Car Fugitive Benzene Emissions**

**Fox (790 lbs/visit, 1 trains/week)**

$Dose_{air} = C_{air} \times \{BR/BW\} \times A \times EF \times 10E-6$

where

$Dose_{air}$  = dose through inhalation (see table below) (mg/kg/day)<sup>-1</sup>

$C_{air}$  = concentration in air (see table below) (1.17E-01) (μg/m<sup>3</sup>)

{BR/BW} = breathing rate normalized to body weight (see table below) (L/kg/day)

A = inhalation absorption factor (1) (unitless)

EF = exposure frequency (0.96) (unitless)

10<sup>-6</sup> = microgram/liter to milligram/cubic meter conversion

Default Values

= (default concentration) x (g/s)

1

for resident: 350 days/365 days

1.1437 Default concentration for 1 g/s at max sensitive receptor from PERIOD501.PLT

1 Visits/week

Emission Rates

790 VOC emission rate Fox (lb/visit)

41,080 VOC emission rate Fox (lb/year) = (VOC lb/visit)(52 weeks/year)(# visits/year)

0.102644 Benzene emission Rate Fox (g/s) = (lb/hour)(453.6 g/lb)/(3600 s/hour)

$Cancer\ risk = Dose_{air} \times CPF \times ASF \times ED/AT \times FAH$

where

CPF = cancer potency factor (0.1) (unitless)

ASF = age sensitivity factor (see table below) (unitless)

ED = exposure duration (30) (years)

AT = averaging time (70) (years)

FAH = fraction of time spent at home (see table below) (unitless)

residential: 30 years (range 9 to 70 years)

From EIR		CARB Spec Factor, frac of TOC	CARB Spec Factor, frac of VOC
Crude Oil Fugitive Emissions			
Based on CARB profile 297			
Pollutant Name	Pollutant ID #		
Benzene	71432	0.024	0.021888
Weight fract ROC/THC gas from crude			0.912

Risk Year	Period (years)	Age Sensitivity Factor (-)	Fraction of Time at Home (-)	Mean {BR/BW} (L/kg/day)	95th percentile {BR/BW} (L/kg/day)	Dose <sub>air</sub> (mean) (mg/kg/day) <sup>-1</sup>	Dose <sub>air</sub> (95th percentile) (mg/kg/day) <sup>-1</sup>	Cancer Risk (mean)	Cancer Risk (95th percentile)
3rd trimester	0.25	10	0.85	225	361	2.53E-05	4.06E-05	9.24E-06	1.48E-05
0<1	1	10	0.85	658	1090	7.41E-05	1.23E-04	2.70E-05	4.48E-05
1<2	1	3	0.85	658	1090	7.41E-05	1.23E-04	8.09E-06	1.34E-05
2<9	7	3	0.72	535	861	6.02E-05	9.69E-05	5.58E-06	8.97E-06
2<16	14	3	0.72	452	745	5.09E-05	8.39E-05	4.71E-06	7.76E-06
9<16	7	3							
16<30	14	1	0.73	210	335	2.36E-05	3.77E-05	7.40E-07	1.18E-06
16<70	54	1	0.73	185	290	2.08E-05	3.26E-05	6.52E-07	1.02E-06
<b>Total for 9-year HRA</b>	<b>9.25</b>					<b>Total for 9-year HRA</b>	<b>4.99E-05</b>	<b>8.20E-05</b>	
<b>Total for 30-year HRA</b>	<b>30.25</b>					<b>Total for 30-year HRA</b>	<b>5.07E-05</b>	<b>8.31E-05</b>	
<b>Total for 70-year HRA</b>	<b>84.25</b>					<b>Total for 70-year HRA</b>	<b>5.53E-05</b>	<b>9.07E-05</b>	

	(in one million)	(in one million)
<b>Total for 9-year HRA</b>	<b>49.9</b>	<b>82.0</b>
<b>Total for 30-year HRA</b>	<b>50.7</b>	<b>83.1</b>
<b>Total for 70-year HRA</b>	<b>55.3</b>	<b>90.7</b>

**Table A-1g: Incremental Cancer Risk from Rail Car Fugitive Benzene Emissions**

**Fox (2,587 lbs/visit, 3 trains/week)**

$Dose_{air} = C_{air} \times \{BR/BW\} \times A \times EF \times 10E-6$

where

$Dose_{air}$  = dose through inhalation (see table below) (mg/kg/day)<sup>-1</sup>

$C_{air}$  = concentration in air (see table below) **3.84E-01** (µg/m<sup>3</sup>)

{BR/BW} = breathing rate normalized to body weight (see table below) (L/kg/day)

A = inhalation absorption factor 1 (unitless)

EF = exposure frequency 0.96 (unitless)

10<sup>-6</sup> = microgram/liter to milligram/cubic meter conversion

**Default Values**

= (default concentration) x (g/s)

1

for resident: 350 days/365 days

**1.1437** Default concentration for 1 g/s at max sensitive receptor from PERIOD501.PLT

1 Visits/week

**Emission Rates**

**2,587** VOC emission rate Fox (lb/visit)

134,524 VOC emission rate Fox (lb/year) = (VOC lb/visit)(52 weeks/year)(# visits/year)

**0.336126** Benzene emission Rate Fox (g/s) = (lb/hour)(453.6 g/lb)/(3600 s/hour)

$Cancer\ risk = Dose_{air} \times CPF \times ASF \times ED/AT \times FAH$

where

CPF = cancer potency factor **0.1** (unitless)

ASF = age sensitivity factor (see table below) (unitless)

ED = exposure duration 30 (years)

AT = averaging time 70 (years)

FAH = fraction of time spent at home (see table below) (unitless)

residential: 30 years (range 9 to 70 years)

From EIR		CARB Spec Factor, frac of TOC	CARB Spec Factor, frac of VOC
Crude Oil Fugitive Emissions			
Based on CARB profile 297			
Pollutant Name	Pollutant ID #		
Benzene	71432	0.024	<b>0.021888</b>
Weight fract ROC/THC gas from crude			0.912

Risk Year	Period (years)	Age Sensitivity Factor (-)	Fraction of Time at Home (-)	Mean {BR/BW} (L/kg/day)	95th percentile {BR/BW} (L/kg/day)	Dose <sub>air</sub> (mean) (mg/kg/day) <sup>-1</sup>	Dose <sub>air</sub> (95th percentile) (mg/kg/day) <sup>-1</sup>	Cancer Risk (mean)	Cancer Risk (95th percentile)
3rd trimester	0.25	10	0.85	225	361	8.29E-05	1.33E-04	3.02E-05	4.85E-05
0<1	1	10	0.85	658	1090	2.43E-04	4.02E-04	8.85E-05	1.47E-04
1<2	1	3	0.85	658	1090	2.43E-04	4.02E-04	2.65E-05	4.39E-05
2<9	7	3	0.72	535	861	1.97E-04	3.17E-04	1.83E-05	2.94E-05
2<16	14	3	0.72	452	745	1.67E-04	2.75E-04	1.54E-05	2.54E-05
9<16	7	3							
16<30	14	1	0.73	210	335	7.74E-05	1.23E-04	2.42E-06	3.86E-06
16<70	54	1	0.73	185	290	6.82E-05	1.07E-04	2.13E-06	3.34E-06
<b>Total for 9-year HRA</b>	<b>9.25</b>					<b>Total for 9-year HRA</b>	<b>1.63E-04</b>	<b>1.63E-04</b>	<b>2.68E-04</b>
<b>Total for 30-year HRA</b>	<b>30.25</b>					<b>Total for 30-year HRA</b>	<b>1.66E-04</b>	<b>1.66E-04</b>	<b>2.72E-04</b>
<b>Total for 70-year HRA</b>	<b>84.25</b>					<b>Total for 70-year HRA</b>	<b>1.81E-04</b>	<b>1.81E-04</b>	<b>2.97E-04</b>
							(in one million)	(in one million)	
						<b>Total for 9-year HRA</b>	<b>163.5</b>	<b>163.5</b>	<b>268.4</b>
						<b>Total for 30-year HRA</b>	<b>165.9</b>	<b>165.9</b>	<b>272.2</b>
						<b>Total for 70-year HRA</b>	<b>181.0</b>	<b>181.0</b>	<b>297.1</b>

# Attachment B

SURFACE TRANSPORTATION BOARD

DECISION

Docket No. FD 36036

VALERO REFINING COMPANY—PETITION FOR DECLARATORY ORDER

Digest:<sup>1</sup> Valero Refining Company (Valero), a noncarrier, asks the Board to issue a declaratory order finding that decisions by the City of Benicia Planning Commission denying certification of an environmental impact report and denying Valero's conditional use permit for a crude oil off-loading facility are preempted by federal law. The Board denies the petition for declaratory order, but provides guidance on the issue of preemption.

Decided: September 20, 2016

By petition filed on May 31, 2016, Valero Refining Company (Valero) seeks a declaratory order finding that the City of Benicia's Planning Commission (Planning Commission) decisions denying certification of an environmental impact report (EIR) and denying Valero's conditional use permit for a crude oil off-loading facility are preempted by 49 U.S.C. § 10501(b). (Valero Pet. 1.) Several parties filed replies both in support<sup>2</sup> of and in opposition<sup>3</sup> to Valero's petition.<sup>4</sup>

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<sup>1</sup> The digest constitutes no part of the decision of the Board, but has been prepared for the convenience of the reader. It may not be cited to or relied upon as precedent. Policy Statement on Plain Language Digests in Decisions, EP 696 (STB served Sept. 2, 2010).

<sup>2</sup> The following parties filed replies in support of Valero's petition: Union Pacific Railroad Company; CSX Transportation, Inc. (CSXT); Canadian National Railway Company (CN); Phillips 66 Company (Phillips 66); Tesoro-Savage Petroleum Terminal, LLC, D/B/A Vancouver Energy (Vancouver Energy); Association of American Railroads (AAR); and QEP Energy.

<sup>3</sup> The following parties filed replies in opposition to Valero's petition: City of Benicia (Benicia); Association of Irrigated Residents, Climate Solutions, Columbia Riverkeeper, Evergreen Islands, Friends of the Columbia Gorge, Friends of the Earth, Resources for Sustainable Communities, Friends of the San Juans, Spokane Riverkeeper, and Washington Environmental Council (collectively, Earthjustice); People of the State of California (California); Benicians; Safe Fuel and Energy Resources California (SAFER California); the Cities of Davis, Berkeley, and Oakland, the County of Yolo, and the Sacramento Area Council of Governments (collectively, California Local Government Agencies); and League of California Cities (League).

<sup>4</sup> James MacDonald also submitted two filings that appear to challenge the construction  
(continued . . . )

For the reasons discussed below, Valero’s petition for a declaratory order will be denied, but the Board will provide guidance concerning other potential preemption issues.

## BACKGROUND

Valero, a noncarrier, owns and operates an oil refinery in Benicia, Cal. (Valero Pet. 1.) According to Valero, 10% of gasoline consumed in California is produced in the Benicia refinery. (Id. at 8.) Valero currently receives crude oil at the refinery by marine vessel from Alaska and foreign sources, and by pipeline from producers in California, but does not receive any crude oil by rail.<sup>5</sup> (Id.) Valero seeks to install a crude off-loading facility because it has determined that it needs access to North American crude oil feedstock—which is economically and competitively accessible only by rail—to remain viable and competitive in the long term. (Id. at 8-9.) Valero states that the proposed off-loading facility would have the capacity to receive 50-car unit trains of crude oil twice per day (approximately 70,000 barrels per day), but that the operating capacity of the refinery would not change. (Id. at 8.)

In December 2012, Valero submitted its land use permit application for construction and operation of the off-loading facility at the Benicia refinery to the Planning Commission. The application stated that the facility would be served by Union Pacific Railroad Company (UP). (Id. at 9.) According to Valero, over the following three years, Benicia city staff and environmental consultants prepared an EIR<sup>6</sup> evaluating the environmental impact of the construction and operation of the off-loading facility. (Id. at 2.) Valero states that, in addition to addressing potential environmental impacts at the proposed facility location, the EIR disclosed potential environmental impacts from proposed UP rail operations between the Benicia refinery and California’s borders with Oregon and Nevada. (Id. at 9.) The EIR did not include proposed mitigation for the potential environmental impacts of UP rail operations because Benicia city staff determined that such measures would be preempted by 49 U.S.C. § 10501(b). (Id. at 9-10.)

On February 11, 2016, the Planning Commission denied certification of the EIR and denied Valero’s land use permit application. The Planning Commission enumerated 14 reasons for denying certification of the EIR, some of which were based on the potential effects of increased rail traffic outside of the off-loading facility location and others that addressed potential effects of the construction and operation of the off-loading facility itself. (See Valero Pet., Ex. 4 at 4-5.) Valero appealed the Planning Commission’s decision to the Benicia City

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( . . . continued)

of Valero’s off-loading facility under state and federal environmental law and do not address whether the Planning Commission’s denials are preempted by federal law. (See MacDonald Reply, July 6, 2015; MacDonald Reply, July 8, 2016.)

<sup>5</sup> Valero states that the refinery does receive isobutane by rail and ships caustic, commercial coke, liquefied propane gas, and petroleum coke by rail. (Valero Pet. 8.)

<sup>6</sup> The EIR refers collectively to the draft EIR, the revised draft EIR, and the final EIR, all prepared by the City of Benicia, apparently to satisfy its obligations under the California Environmental Quality Act (CEQA). (Valero Pet. 9.)

Council. (*Id.* at 12.) The City Council voted on April 19, 2016, to defer a decision until September 20, 2016, to allow Valero to raise the issue of preemption with the Board.

Valero challenges the Planning Commission’s denial of certification of the EIR and of the land use permit as impermissibly based on findings of environmental impacts related to UP’s increased rail traffic. (*Id.* at 12.) Valero asserts that Benicia is engaged in impermissible indirect rail regulation, stating that “[t]he Planning Commission Resolution is so full of managing, governing and regulating rail transportation that it is not possible to determine with any degree of certainty what action the Planning Commission would have taken on the EIR or the permit if it had acted within the bounds of its authority.” (Valero Pet. 16.) Valero maintains that the Planning Commission’s refusal to certify the EIR and denial of the land use permit are federally preempted under § 10501(b) because they prevent rail transportation of crude oil to the refinery, deny Valero its right to receive rail service, and prevent UP from providing such rail service. *Id.*

UP, Vancouver Energy, AAR, Phillips 66, CN, CSXT, and QEP Energy support Valero’s petition and ask the Board to provide guidance on the scope of permissible indirect rail regulation in these circumstances. (*See, e.g.*, UP Reply 1.) Benicia also requests that the Board provide guidance on its ability to impose conditions on Valero that are designed to avoid or mitigate impacts related to rail operations, although it opposes the petition. (Benicia Reply 1.)

Benicia argues that, in denying certification of the EIR and approval of Valero’s land use permit, it was exercising its local land use authority pursuant to CEQA. (Benicia Reply 2.) According to Benicia, its actions are not federally preempted, because Valero is a noncarrier and is not acting as an agent for a rail carrier in constructing and operating the off-loading facility. (*Id.* at 1-2, 7-8.) Earthjustice, California Benicians, SAFER California, California Local Government Agencies, and the League also ask the Board to find that the Planning Commission’s decisions are not preempted.

## DISCUSSION AND CONCLUSIONS

The Board has discretionary authority under 5 U.S.C. § 554(e) and 49 U.S.C. § 1321 to issue a declaratory order to eliminate controversy or remove uncertainty in a matter related to the Board’s subject matter jurisdiction. *See, e.g., Bos. & Me. Corp. v. Town of Ayer*, 330 F.3d 12, 14 n.2 (1st Cir. 2003); *Delegation of Auth.—Declaratory Order Proceedings*, 5 I.C.C.2d 675, 675 (1989). Where appropriate, the Board may decline to institute a proceeding and instead provide guidance on the preemption issue presented, as the Board will do here. *See, e.g., 14500 Ltd.—Pet. for Declaratory Order*, FD 35788, slip op. at 2 (STB served June 5, 2014).

The Interstate Commerce Act (Act) is “among the most pervasive and comprehensive of federal regulatory schemes.” *Chi. & N.W. Transp. Co. v. Kalo Brick & Tile Co.*, 450 U.S. 311, 318 (1981). The federal preemption provision contained in § 10501(b) bars the application of most state and local laws to railroad operations that are subject to the Board’s jurisdiction.<sup>7</sup>

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<sup>7</sup> State or local permitting or preclearance requirements, including building permits, zoning ordinances, and environmental and land use permitting requirements, are categorically (continued . . . )

Because the Board has jurisdiction over “transportation by rail carrier,” 49 U.S.C. § 10501(a), to be subject to the Board’s jurisdiction and qualify for federal preemption under 49 U.S.C. § 10501(b), the activities at issue must be “transportation” and must be performed by, or under the auspices of, a “rail carrier.” The statute defines “transportation” expansively to encompass any property, facility, structure or equipment of any kind related to the movement of passengers or property, or both, by rail, and services related to that movement, including receipt, delivery, transfer in transit, storage, and handling of property. 49 U.S.C. § 10102(9). Moreover, “railroad” is defined broadly to include a switch, spur, track, terminal, terminal facility, freight depot, yard, and ground, used or necessary for transportation. 49 U.S.C. § 10102(6). Whether a particular activity is considered part of transportation by rail carrier under § 10501 is a case-by-case, fact-specific determination. City of Alexandria, Va.—Pet. for Declaratory Order, FD 35157, slip op. at 2 (STB served Feb. 17, 2009); see also, N.Y. & Atl. Ry. v. STB, 635 F.3d 66, 73-74 (2nd Cir. 2011).

The Board finds here that there is no preemption because the Planning Commission’s decision does not attempt to regulate transportation by a “rail carrier.” The Board’s jurisdiction extends to rail-related activities that take place at transloading (or, as here, off-loading) facilities if the activities are performed by a rail carrier, the rail carrier holds out its own service through a third party that acts as the rail carrier’s agent, or the rail carrier exerts control over the third party’s operations.<sup>8</sup> The record presented to the Board in this case, however, does not

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preempted as to any facilities that are part of transportation by rail carrier. See Green Mountain R.R. v. Vermont, 404 F.3d 638, 643 (2d Cir. 2005). Other state actions may be preempted as applied—that is, only if they would have the effect of unreasonably burdening or interfering with rail transportation. See N.Y. Susquehanna & W. Ry. v. Jackson, 500 F.3d 238, 252 (3d Cir. 2007); Joint Pet. for Declaratory Order—Bos. & Me. Corp. & Town of Ayer, 5 S.T.B. 500, 507-08 (2001), recons. denied (STB served Oct. 5, 2001). Even where § 10501(b) preemption applies, there are limits to its scope. Overlapping federal statutes are to be harmonized, with each statute given effect to the extent possible. Moreover, states retain police powers to protect the public health and safety on railroad property so long as state and local regulation do not unreasonably interfere with interstate commerce. Ass’n of Am. R.R.s v. S. Coast Air Quality Mgmt. Dist., 622 F.3d 1095, 1097-98 (9th Cir. 2010); Green Mountain, 404 F.3d at 643.

<sup>8</sup> Compare Green Mountain, 404 F.3d at 642 (transloading and temporary storage of bulk salt, cement, and non-bulk foods by a rail carrier qualified for preemption); Lone Star Steel Co. v. McGee, 380 F.2d 640, 647 (5th Cir. 1967), City of Alexandria (ethanol transload facility operated under auspices of a rail carrier qualified for preemption), and Ass’n of P&C Dock Longshoremen v. Pittsburgh & Conneaut Dock Co., 8 I.C.C.2d 280, 290-95 (1992) (an agent undertaking the obligations of a common carrier (i.e., performing services as part of the total rail service contracted for by a member of the public) also holds itself out to the public as being a common carrier by rail, and is therefore subject to federal regulation), with Town of Milford, Mass.—Pet. for Declaratory Order, FD 34444, slip op. at 3-4 (STB served Aug. 12, 2004) (Board lacked jurisdiction over noncarrier operating a rail yard where it transloaded steel pursuant to an agreement with the rail carrier, but the transloading services were not being offered as part of common carrier services offered to the public); High Tech Trans, LLC—Pet. for Declaratory

(continued . . . )

demonstrate that Valero is a rail carrier or that it is performing transportation-related activities on behalf of UP or any other rail carrier at its off-loading facility.

Relying on Boston & Maine Corp.—Petition for Declaratory Order (Winchester), FD 35749 (STB served July 19, 2013), Valero argues that the Planning Commission’s actions have deprived it of the right to receive common carrier rail service and are, thus, federally preempted under § 10501(b). Winchester, however, involved a local regulation that would have stopped a rail carrier from operating its existing common carrier rail service over the line in question. The Board determined that § 10501(b) preempted this regulation because it prevented the rail carrier from conducting its operations in interstate commerce. Unlike the facts in Winchester, Valero has not identified an attempt by the Planning Commission to regulate *UP’s* operations. Here, Valero’s challenge involves the Planning Commission’s decisions regarding *Valero’s* off-loading facility, and Valero is not a rail carrier, nor is it acting under the auspices of a rail carrier.

Valero also cites Norfolk Southern Railway v. City of Alexandria (Alexandria), 608 F.3d 150 (4th Cir. 2010), for the premise that a locality cannot indirectly regulate rail transportation by regulating noncarriers. Alexandria is inapposite, however, as it involved an ethanol transload facility constructed and owned by Norfolk Southern Railway Company and operated under its auspices. As noted above, Valero makes no allegation that it is a rail carrier or that it would be performing offloading under the auspices of a rail carrier at the facility at issue here.

Instead, the facts here are more analogous to the Board’s decision in SEA-3, Inc.—Petition for Declaratory Order (SEA-3), FD 35853 (STB served Mar. 17, 2015). In that case, SEA-3—a noncarrier seeking to expand an offload facility served by a single rail carrier—claimed that the expansion of its facility was necessary for it to receive cost-effective propane. SEA-3, slip op. at 2. Portsmouth, a nearby city, sought to stop construction of the expanded facility, and SEA-3 claimed that Portsmouth opposed the project because it wanted to block the rail traffic that would travel through the city. Id. SEA-3 filed a petition with the Board arguing that any attempt by a locality or state to direct rail traffic or impose preclearance requirements on an offload facility is federally preempted. Id. The Board in SEA-3 found that the local government’s participation in zoning litigation over the expansion of SEA-3’s facility was not preempted and did not reflect undue interference with transportation by rail carriers. Id., slip op. at 6-7. The Board stated that if the locality “were to take actions as part of a proposed safety/hazard study, or otherwise, that interfere unduly with [the railroad’s] common carrier operations, those actions would be preempted under § 10501(b).” Id. at 7 (citing Winchester).

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Order—Newark, N.J., FD 34192 (Sub-No. 1), slip op. at 7 (STB served Aug. 14, 2003) (no STB jurisdiction over truck-to-truck transloading prior to commodities being delivered to rail); and Town of Babylon & Pinelawn Cemetery—Pet. for Declaratory Order, FD 35057, slip op. at 5 (STB served Feb. 1, 2008) (Board lacked jurisdiction over activities of a noncarrier transloader offering its own services directly to customers).

Although Valero argues that the facts in this case are distinguishable from SEA-3, its arguments are not persuasive. As discussed above, Valero has not demonstrated that the Planning Commission's decisions unreasonably interfere with UP's common carrier operations. Accordingly, this situation, like the situation in SEA-3, does not reflect undue interference with "transportation by rail carriers" within the Board's jurisdiction under § 10501(b).

Benicia also seeks Board guidance on: (1) whether § 10501(b) preempts Benicia from imposing mitigation measures or conditions of approval of the use permit that would directly regulate the activities of UP; and (2) whether Benicia could impose mitigation measures or conditions of approval on Valero to alleviate indirect impacts related to the project that are caused by the activities of UP in delivering crude oil by rail. (Benicia Reply 16.) As an initial matter, any attempt to regulate UP's rail operations on its lines would be categorically preempted. CSX Transp. Inc.—Pet. for Declaratory Order, FD 34662, slip op. at 5 (STB served May 3, 2005). Otherwise, state and local regulation is permissible where it does not unreasonably interfere with rail transportation. Ass'n of Am. R.R.s, 622 F.3d at 1097; Alexandria, 608 F.3d at 158, 160. Localities retain their reserved police powers to protect the public health and safety so long as their actions do not discriminate against rail carriers or unreasonably burden interstate commerce. See Ass'n of Am. R.R.s, 622 F.3d at 1097; Green Mountain, 404 F.3d at 643. For example, local electrical, plumbing, and fire codes are generally applicable. Green Mountain, 643 F.3d at 643. State and local action, however, must not have the effect of foreclosing or unduly restricting the rail carrier's ability to conduct its operations or otherwise unreasonably burden interstate commerce. See CSX Transp. Inc.—Pet. for Declaratory Order, FD 34662, slip op. at 5 (STB served May 3, 2005); see also Ass'n of Am. R.R.s, 622 F.3d at 1079-98. If the offloading facility were eventually to be constructed but the EIR or the land use permit, or both, included mitigation conditions unreasonably interfering with UP's future operations to the facility, any attempt to enforce such mitigation measures would be preempted by § 10501(b).

It is ordered:

1. Valero's petition for declaratory order is denied, and this proceeding is discontinued.
2. This decision is effective on the date of service.

By the Board, Chairman Elliott, Vice Chairman Miller, and Commissioner Begeman.  
Commissioner Begeman concurred with a separate expression.

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Commissioner Begeman, concurring:

I concur only in the Board's decision that the City of Benicia's Planning Commission certification and permit denials are not preempted by 49 U.S.C. § 10501(b).