

# Community wins historic ‘clean safe jobs’ permit in oil refinery expansion struggle

**Chevron required to use least-emitting safest refining technology, support community-based ‘just transition’ to sustainable energy**

**Chevron challenges permit: Hearings on July 22<sup>nd</sup> and 29<sup>th</sup>, 2014**

**Richmond, CA:** Community organizing won a 7–0 Planning Commission vote to include cleaner, safer energy conditions in the land use permit for Chevron’s Richmond Refinery Modernization Project. The July 10, 2014 ‘clean safe jobs’ permit requires Chevron to upgrade old, unsafe technology that allows excessive air pollution and poses catastrophic chemical release hazards, and to support a community-based Clean Energy Jobs Program for climate protection at \$8 million per year through 2050.

The permit protects communities and workers from environmental health and safety hazards and addresses flaws in the project’s Environmental Impact Report (EIR) by ensuring that the troubled plant moves decisively toward safer, least-emitting refining.

It also could mark an historic turning point in the struggle to organize a ‘just transition’ for communities and workers in the shadow of the smoke stacks. Its adoption could herald a new and more inclusive strategy, that ties the urgent need for least-impact oil refining in disparately pollution-blighted communities to the essential need for many more of us to find jobs doing the work that transforms our energy system for climate protection. This strategy could create exactly the kind of jobs engine for clean energy that we need to turn the corner on our impending climate catastrophe.

But the permit is in peril. Chevron attacked it, arguing the project is clean and safe enough without these permit conditions. Chevron is the largest and most influential oil company in the state. Its Richmond plant is the largest oil refinery in the state.<sup>1</sup> Eleven hours after it filed this appeal, another pipe leaked oil that caught fire in its refinery.

City Council hearings on Chevron’s appeal are set for the evenings of July 22<sup>nd</sup> and 29<sup>th</sup>, 2014. This report is intended to support community, worker, and public participation in the hearings. CBE’s review of the project with community members and workers found critical needs to lessen or avoid severe safety, air quality, and climate impacts—and reasonable solutions to meet these priority needs. CBE’s safety hazard, air quality, and climate justice analysis strongly supports the permit conditions requiring these solutions.

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<sup>1</sup> Richmond’s oil processing capacity of ≈300,000 barrels/day includes ≈50,000 b/d of ‘gas oil’ that is purchased separately from its crude feed and bypasses its crude unit, feeding directly to its gas oil hydroprocessing and catalytic cracking units. Previously unreported, this unusually large separate gas oil capacity makes comparisons based on crude capacity alone inaccurate when this refinery is described.

## The Problem

As proposed, Chevron's revised project would expand its Richmond refinery's capacity to process high-sulfur gas oil, to make the hydrogen for that processing, and to recover sulfur from that processing. This would enable the refinery to process both crude with substantially greater sulfur content *and* a substantially greater volume of separately purchased high-sulfur gas oil. High-sulfur gas oil carries other contaminants and can be as dense as 'heavy' crude oil. The refinery's oil feedstock could thus grow in volume and become denser and more contaminated, increasing corrosion of process equipment in high temperature service and pollutant releases to the environment. Total fossil fuel use, including hydrogen feedstocks and combustion of petroleum 'catalyst' coke, natural gas and other fuels, would increase.

## Safety Hazard Analysis

Catastrophic hazard would increase because recovering more sulfur from project oil feeds requires bonding more hydrogen with that sulfur, forming more hydrogen sulfide (H<sub>2</sub>S), a noxious, toxic, and—at process heats above ≈450 °F—highly corrosive compound. The resultant 'sulfidic' corrosion is especially hazardous because it causes general thinning of steel that is hard to detect and can lead to catastrophic ruptures of pressurized equipment. Old carbon steel is especially vulnerable. The pipe that was thinned by sulfidic corrosion and burst catastrophically in Chevron's massive fire in January 2007 was old carbon steel.<sup>2</sup> So was the one that burst catastrophically in its disastrous August 6, 2012 fire.

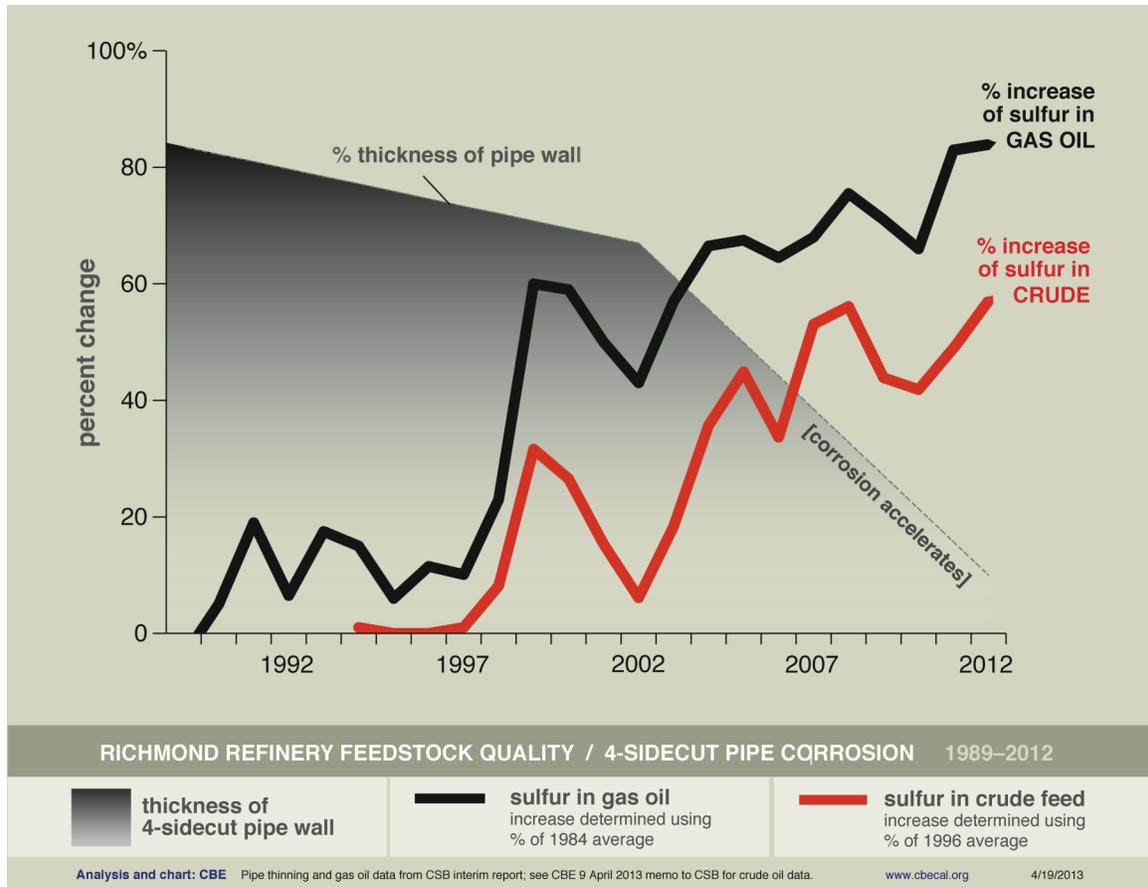
Chevron management deferred replacement of piping that its refining of higher sulfur crude was corroding (see Chart), ignoring its own workers' warnings for ten years, until the pipe ruptured catastrophically in Chevron's August 6, 2012 fire that nearly killed 20 workers and sent some 15,000 residents to the hospital.<sup>2</sup>

Old carbon steel pipes that were left in place too long in many parts of the plant already pose the kind of chemical spill, fire, and explosion hazard that manifest catastrophically in August 2012. Deferring replacement of this equipment is hazardous with current oil feedstock. Putting even higher sulfur, more corrosive oil through this aging, vulnerable equipment further increases the hazard. It could make the refinery a ticking time bomb. But Chevron's EIR<sup>3</sup> would replace this old equipment in only some parts of the refinery, deferring action—letting the bomb tick—in the equally unsafe equipment that could increasingly be corroded by the project's higher sulfur oil in other parts of the refinery.

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<sup>2</sup> U.S. Chemical Safety Board, 2013. *Interim Investigation Report, Chevron Richmond Refinery Fire*.

<sup>3</sup> EIR SCH# 2011062042; Lead Agency: City of Richmond.



Chevron’s EIR argues that beefed up inspection and monitoring will keep us safe, but monitoring alone cannot catch every impending failure from corrosion on the *inside* of every pipe and vessel in time, every time. It also argues that post-construction reviews should decide whether to upgrade these other old components in the plant, but upgrades that are feasible *before* something is built may not be so easy *after* it is already built.<sup>4</sup> In short, the EIR’s approach, that it’s ‘safe enough’ to defer safety upgrades, was Chevron’s approach in the run-up to its 2012 disaster, and it is part of the problem.

***Inherent Safety Conditions***

Condition G-4<sup>5</sup> requires replacing all carbon steel components installed before 1990 processing oil hotter than 450 °F with inherently safer corrosion-resistant technology by the end of 2017, replacing all equipment that leaked in the past and was only

<sup>4</sup> Indeed: “It is simpler, less expensive, and more effective to introduce inherently safer features during the design process of a facility rather than after the process is already operating.” U.S. Chemical Safety Board, 2013. *Interim Investigation Report, Chevron Richmond Refinery Fire*.

<sup>5</sup> See 7/10/14 Planning Commission resolution adopting the CUP for the full conditions summarized here.

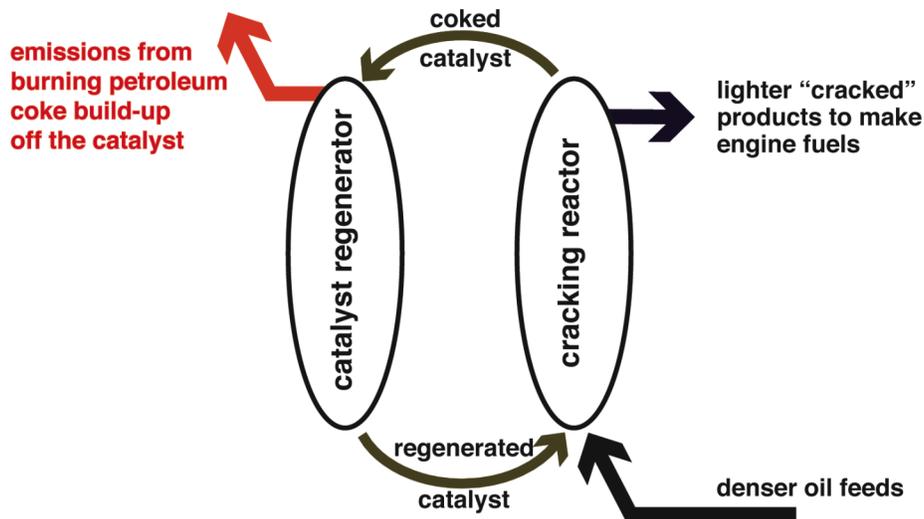
patched or 'clamped' at the next scheduled maintenance shutdown, and replacing any that leaks in the future with inherently safer equipment as soon as it is safely possible.

Critical worker and community safety needs are addressed by these conditions—they may well save lives. These conditions address the inability of monitoring alone to find imminent failures of unsafe refinery equipment in time, every time. They address increasing corrosion hazards in parts of the refinery, outside the crude unit, where replacing old and unsafe equipment is critical to protect workers and the community but no commitment to do so exists in Chevron's EIR.

In addition to these community and worker health and safety protection needs, installing these measures as part of the project will be more effective and less costly, and installing these measures will create additional local pipefitting and construction jobs.

**Air Quality Analysis**

Air pollution from the project is strongly related to burning more of the oil barrel to make gasoline from its denser oil feedstock, especially at Chevron's fluid catalytic cracker (FCC, or 'cat cracker'). Cat cracking is designed to make more gasoline from denser oil.<sup>6</sup> Some of the oil forms coke in this process, that coke builds up on its catalyst, it is burned off to keep the catalyst active, and burning that coke causes the cat cracker's massive air emissions. (See Diagram.)



**Diagram: Fluid Catalytic Cracking Process—Oil, Catalyst, and Emission Flows**

<sup>6</sup> See Speight, 2013. *Heavy and Extra-heavy Oil Upgrading Technologies*; esp. pp. 48-51, 86-116.

The project would not change Chevron's cat cracker equipment, but by expanding the amount of high-sulfur heavy gas oil the hydrotreater upstream could process and then feed to the cat cracker, the project would 'debottleneck' the cat cracker, enabling it to process more heavy gas oil.<sup>7</sup> This increase in its gas oil throughput could increase cat cracker emissions of fine particulate matter (PM<sub>2.5</sub>) by 260–590 pounds per day,<sup>7</sup> an amount far above the 54 lb/day threshold of environmental significance in the EIR.

A throughput limit that holds the cat cracker to its current feed rate could prevent this significant impact. This can be done: the EIR limits the Richmond Solvent De-Asphalter (SDA) unit's feed rate to lessen potential impacts from increased crude feed density.

But Chevron has already increased the cat cracker's throughput since it rebuilt the unit in the mid-1990s, and its emissions exceed its *existing* permit limits, especially for PM<sub>2.5</sub>.<sup>8</sup> From 2009–2011 the cat cracker emitted PM<sub>2.5</sub> at an average rate of ≈1,730 lb/d, which exceeds the 500 lb/d limit in its air permit by ≈1,230 lb/day.<sup>7</sup>

Chevron admits that expanding the unit's electrostatic precipitator to replace its ongoing ammonia injection is feasible and may eliminate nearly all of its PM<sub>2.5</sub> emission excess.<sup>9</sup>

This PM<sub>2.5</sub> air pollution forms in the cat cracker, its plume, and downwind in the air we breathe. Based on monitoring of this total emission impact, the South Coast Air Quality Management District required LA Area refiners to take the same kinds of measures Chevron could take here to cut cat cracker PM<sub>2.5</sub> emissions—starting in 2003.<sup>10</sup> In contrast, more than ten years later, the Bay Area Air Quality Management District (BAAQMD) still declines to require any clean up of Chevron's cat cracker at this time, claiming it still does not know how to monitor or curb its emissions.<sup>11</sup>

An estimated 2,800 people die prematurely from health problems associated with air pollution in the Bay Area each year, and "PM<sub>2.5</sub> accounts for the vast majority" of these health problems.<sup>12</sup> Chevron's cat cracker emits more PM<sub>2.5</sub> than the rest of its refinery combined, and more than all other sources in Richmond combined.<sup>7</sup> Yet Chevron's EIR proposes to 'mitigate' its cat cracker emission impacts by deferring to the BAAQMD's inaction.<sup>13</sup> Deferring to inaction is not mitigation: it is part of the problem.

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<sup>7</sup> See CBE Comment 2, City of Richmond Planning Dept. File PLN11-089.

<sup>8</sup> The cat cracker also exceeds its VOC limit. Compare BAAQMD data in EIR A4.3-EI with Condition 11066 in App. 25682 and Title V air permits for fluid catalytic cracker (FCC; BAAQMD Source S-4285).

<sup>9</sup> Chevron states this can cut emissions by up to 1,200 lb/d: see EIR Transmittal #74 Rev. #1.

<sup>10</sup> SCAQMD, 2003. *Final Environmental Assessment for Proposed Rule 1105.1*; ([www.aqmd.gov](http://www.aqmd.gov)).

<sup>11</sup> 20 May 2014 letter from Jeff McKay, Deputy APCO, BAAQMD to Lina Velasco, City of Richmond.

<sup>12</sup> See BAAQMD, 2012. *Understanding Particulate Matter* at page 27.

<sup>13</sup> See CBE Comment 4, City of Richmond Planning File PLN11-089; see also FEIR at 3-47 and 3-48.

### *Clean Air Conditions*

Condition D-4 requires expanding the cat cracker's electrostatic precipitator and replacing its ammonia injection, and limits its average oil feed rate at current levels, to prevent and reduce emissions exceeding its current emission limits of 184,00 lb/yr for PM<sub>2.5</sub> and 12,200 lb/yr for VOC. This condition also requires using the best available emission monitoring technology to confirm these existing limits are met.

These *Clean Air* conditions address critical community and worker health needs. They also solve the problem of improper deferred project mitigation, and avoid a significant potential impact of the project from foreclosing measures needed to meet existing emission limits. Excess and increased PM<sub>2.5</sub> emissions avoided by this condition could total ≈1,460–1,820 pounds/day, an amount equal to 37–46% of all PM<sub>2.5</sub> emissions from all sources in Richmond today.<sup>14</sup> In addition to this environmental health protection, the work to install and operate monitoring and control equipment will create local jobs.

### **Climate Justice Analysis**

Climate pollution from the project would emit mainly as the carbon dioxide byproduct of stripping hydrogen from hydrocarbons to feed the project's expanded hydroprocessing of higher-sulfur heavy gas oil. Despite the new hydrogen plant's efficiency, it would be so much bigger than the old one, which it would replace, that the project's net emissions of greenhouse gases (GHGs) could increase by 725,000–890,000 metric tons per year.<sup>15</sup> These project emissions would exceed the climate impact significance threshold in the EIR by 72–89 *times*, make the refinery the biggest industrial GHG emitter in California, and—if the new hydrogen plant runs as long as the old one has—continue for 48 years.

Chevron's EIR proposes to offset 99% of these emissions elsewhere, outside Richmond, through its plan to buy carbon emission trading credits to 'offset' emissions.<sup>16</sup> It speaks theoretically about an obligation to consider such least-cost measures for Chevron, but in the real world, the side effects or secondary impacts of its proposal could commit the community to 30–50 years of disparately increased pollution and blight.

By leaving virtually all of this massive GHG emission increase unmitigated locally, Chevron's proposal would prolong and increase disparately severe localized pollution and hazards in low-income communities of color. The H<sub>2</sub>S safety hazard created with its

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<sup>14</sup> See CBE Comment 2, City of Richmond Planning Dept. File PLN11-089 (chart and table data).

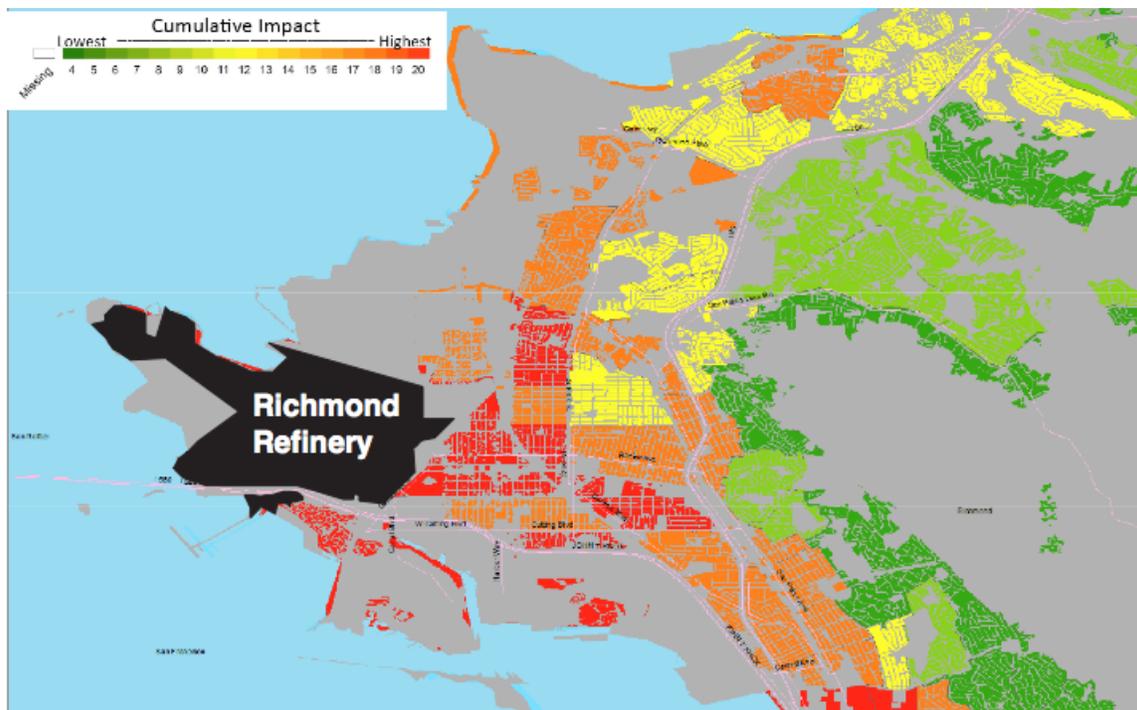
<sup>15</sup> GHG in carbon dioxide equivalents (CO<sub>2</sub>e) from Chevron's EIR (EIR SCH# 2011062042), which may underestimate the project's potential GHG emissions.

<sup>16</sup> See EIR SCH# 2011062042, RDEIR at 4.8-36 through 4.8-40.

hydrogen to expand hydroprocessing of high-sulfur heavy gas oil, the further increase in excess PM<sub>2.5</sub> emissions from the increased cat cracker rate its expanded hydroprocessing enables, and the increased GHG emissions from its expanded hydrogen plant, are all co-pollutants of one project. The EIR's impact analysis further reveals the interdependence of these co-emitting project components<sup>17</sup> that its mitigation analysis ignores.

For example, the GHG-intensive hydrogen enables debottlenecking of the cat cracker, increasing local PM<sub>2.5</sub> emissions significantly, and—because the cat cracker already exceeds its existing emission limit by about as much as available measures are expected to reduce its emissions—that emission increase could foreclose the ability ever to meet this emission limit that is supposed to protect local air quality.

Similarly, exporting 99% of the work to offset project emissions deprives Richmond and surrounding communities—the same communities that are most impacted by these GHG co-pollutants and already face disparate impacts of pollution and pollution-related blight (see Map)—of those jobs created in connection with the locally emitted GHG. Pollution-related socioeconomic impacts of sending 99% of jobs in the new energy economy away for 30–50 years threaten to leave Richmond's communities behind as the new clean energy economy develops elsewhere.



**Map: Total Cumulative Impact Score, Richmond, CA.** Adapted from Sadd, J.; Pastor, M.; Morello-Frosch, R., 2011. *Analysis for the California Environmental Justice Alliance*.

<sup>17</sup> See EIR SCH# 2011062042, RDEIR at A4.3-URM.

Part of the reason Chevron's EIR proposes to do only  $\approx 1\%$  of its GHG cleanup work here is its lack of consideration for mitigation that can be implemented locally after the first ten years of project operation—after 2025. The project can be expected to emit GHGs for several decades. State plans during those decades would seek, before 2050, to reduce total GHG emissions to 80% below 1990 levels,<sup>18</sup> and to transform transportation so that virtually all vehicles in the state are zero-emission.<sup>19</sup> Our communities can do much more than 1% of project GHG mitigation locally, by organizing a more inclusive program that puts more workers, Richmond and surrounding area residents and community members to work here now, and keeps us working through 2035–2050.

### *Climate Justice Condition*

Condition D-3 requires supporting a community-governed Clean Energy Jobs Program to develop energy conservation, energy efficiency, bicycle use, public transit, distributed solar, energy storage, electric vehicle infrastructure and rebates, and tree canopy programs in Richmond, North Richmond, and San Pablo by providing \$8 million/year from 2015–2050 in order to meet 2050 GHG targets.

This *Climate Justice* condition addresses the disparate increase in local pollution and blight from the project and its proposed mitigation, and the resultant impairment of adaptive capacity for long-term climate protection, at its root causes. It also addresses the problems of ignoring feasible local mitigation and unnecessary reliance on speculative, non-specific future measures at remote sites.

Implementing this condition's community-based Clean Energy Jobs Program will reduce the socioeconomic impacts of a 30–50 year commitment to extreme oil infrastructure and its future emissions that threaten to leave our communities behind in a rapidly evolving energy resource economy. It will support a just transition for our communities and workers to participate in the clean energy jobs engine that could solve our climate crisis, and it will create more sustainable local jobs.

**All of these future benefits and critically needed health, safety, and climate protections for our communities and workers could be lost unless we stand together to ensure that the Richmond City Council will support the 'clean safe jobs' permit.**

**CBE–Richmond  
July 18, 2014**

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<sup>18</sup> Governor's Executive Order No. S-3-05 (June 1, 2005); Health & Safety Code, § 38501, et seq.; Air Resources Board, Climate Change Scoping Plan (2008).

<sup>19</sup> See Governor's Executive Order No. B-16-2012 (March 23, 2012).