VALERO
Benicia Refinery

September 13, 2016

Mayor Elizabeth Patterson
and Members of the City Council
City of Benicia
250 East L Street
Benicia, CA 94510

Re: Further Rebuttal in Support of Appeal of Planning Commission Resolution No. 16-1, Denying Use Permit Application 12PLN-00063 and Declining to Certify Final Environmental Impact Report for the Valero Benicia Crude-by-Rail Project (SCH #2013052074)

Dear Mayor Patterson and Members of the City Council:

I am writing on behalf of Valero Refining Company – California ("Valero"), for the purpose of addressing and resolving, as simply and clearly as possible, a number of legally and factually unfounded comments that project opponents have presented to the City, relying primarily on the highly misleading analysis submitted by Dr. Phyllis Fox.

I have a Bachelor of Science in Mechanical Engineering from Lafayette College in Easton, Pennsylvania, and a Masters in Business Administration (MBA) from St. Mary's College in Moraga, California. I have over 38 years of refining experience, including 35 at the Benicia Refinery. For the last 20 years, I have worked in the Refinery's environmental department, with a great deal of experience and on-the-job expertise in Emissions Inventories, New Source Review and Title V (Clean Air Act) permitting and compliance programs. I am currently the Environmental, Health, Safety, Community/Government Affairs Director for the Benicia Refinery.

1. Introduction

Dr. Fox's comments rest mainly on the erroneous contention that the Final Environmental Impact Report ("FEIR") for the Valero Crude-by-Rail ("CBR") Project must be redone because Bakken crudes may be imported and processed by Valero. First, it must be noted that Valero has already processed Bakken crude. Dr. Fox has made the mistake in any event of assuming that Valero needs permission from the City or from the Bay Area Air Quality Management District ("BAAQMD") to store and process North American crudes, including Bakken.

Valero Refining Company-California • 3400 East Second Street • Benicia, California 94510-1097
Telephone 707.745.7011 • Facsimile 707.745.7514

In fact, Valero ***already*** has the legal right to store and process ***any*** crudes available on the market, as long as it does so consistent with its rights and obligations as established by the City and BAAQMD approvals of 2003 and 2008, for the Valero Improvement Project ("VIP"). The VIP Project was approved after full environmental review of the Project's impacts, impacts that have been fully mitigated and offset. In reliance on the approvals granted by the City and BAAQMD, Valero built and has operated the approved refinery modifications, at great expense. When the City and BAAQMD approved the VIP Project, they imposed no restrictions on the crudes that Valero was permitted to store and process.

As a result of constructing and operating the VIP Project refinery modifications, especially the Flue Gas Scrubber, criteria pollutant emissions and toxic releases were reduced by extraordinary amounts, and the emissions reductions have remained constant since activation of the FGS in 2011. The Flue Gas Scrubber permanently reduced emissions of Criteria Pollutants (SO2, VOC, NOx, CO and PM) by over 5,000 tons per year. Additional permanent reductions of over 300 tons per year were achieved for toxic compounds such as ammonia and sulfuric acid mist through compliant Scrubber operation.

Now, in effect, Dr. Fox and others contend that the City and BAAQMD should have performed for the VIP Project a crude-based analysis of the impacts of maximum operating conditions, and that the CBR Project provides the City an opportunity to undo and second-guess the City's approval of the VIP Project. There is no legal justification whatsoever for repeating the VIP environmental review.

Putting aside the legal irrelevancy of Dr. Fox's emissions comments, the fundamental factual error that pervades all of her comments lies in her assertion that crude type drives emissions levels. It does not, as demonstrated by the analysis I have attached to this letter as Appendix 1, which was prepared under my immediate supervision. Appendix 1 graphically demonstrates that emissions levels are driven not by crude type, but by throughput. The environmental review of the impacts of operating the refinery at maximum throughput levels took place in 2003 and 2008, and cannot now lawfully be re-opened.

What the City is required to do for the environmental review of the CBR Project is to review the impacts ***only*** of the construction and operation of the rack, and of any piping that will be installed and employed for the purpose of facilitating operation of the unloading rack, in accordance with BAAQMD-established protocols for assessment of those specific impacts. The FEIR does precisely what it is required to do by law, thoroughly and in painstaking detail.

2. Tank Emissions

Dr. Fox contends that the CBR FEIR does not address increased emissions from storing Bakken or Bakken-like crudes. The argument is irrelevant to the CBR

Project: Valero has not proposed ***any*** changes to the number of tanks, the emissions allowed for such tanks, or to store any crudes it is not already authorized to store by virtue of the VIP approvals.

Putting aside the legal irrelevancy of Dr. Fox's comments on tank emissions, her comments and calculations are based on radically erroneous assumptions about Valero's operations (see her letter of 9-15-14): (1) She assumes that Valero would replace a heavy sour crude with a light sweet crude like Bakken, when given the operational limitations of the refinery, if a light sweet crude is replaced it must be replaced with a similar light sweet crude; thus, a heavy sour crude would never be replaced with a light sweet crude (see Appendix 1); (2) She assumes a vapor pressure of 15.5 psi for Bakken crude, when Valero is limited by BAAQMD Regulation 8-5 to a vapor pressure in its storage tanks of less than 11 psi; (3) She assumes refinement of 70,000 barrels per day of Bakken crude, another operational impossibility.

(a) Tanks

Dr. Fox contends that the TANKS "model" (in actuality, a methodology rather than a model) is not adequate because it fails to take account of roof landing losses and inspection losses. The Storage Tank Emission Estimate Methodology was developed by the federal Environmental Protection Agency ("EPA"), entitled Compilation of Air Pollutant Emission Factors, and is referred to as AP-42, previously known as TANKS 4.09d. BAAQMD uses the methodology for estimation of tank emissions, and the methodology is the standard in the industry and used by the Bay Area Air Quality Management District (BAAQMD) for New Source Review permitting. The City's reliance on the TANKS methodology is therefore supported by substantial evidence. The fact that Dr. Fox disagrees with the EPA and BAAQMD does not provide a basis for rejecting the methodology as a substantial evidence basis for assessment of tank emissions.

(b) Tank Cleaning

Likewise, none of Dr. Fox's "tank cleaning" arguments provide a valid basis for criticism of the CBR EIR. "Roof landing" occurs as the storage tanks are prepared for tank cleaning. The U.S. Department of Transportation requires storage tank inspections and cleaning every 20 years, ***regardless of crude type***. In addition, storage tank cleaning requires degassing the tank using an abatement device that complies with the requirements of BAAQMD Regulation 8-5, and achieves an abatement efficiency of at least 90%. Compliance with requirements imposed by relevant regulatory agencies is sufficient for compliance with CEQA.

(c) Geodesic Domes

As for Dr. Fox's argument that geodesic domes must be used for the tanks, the argument is irrelevant to the City's review of Valero's CBR Project, since Valero has not proposed any changes to the number of tanks, the emissions allowed for such tanks, or to store any crudes it is not already authorized to store.

(d) Tank Flashing Emissions

Bakken crudes, Dr. Fox contends, are transported raw, that is, without stabilization, leaving them prone to tank flashing emissions in the event of temperature increases or decreases in pressure. She contends that the TANKS methodology does not estimate these tank flashing emissions.

First, as already established, tank emissions are irrelevant to the City's review and approval of the CBR Project.

Second, Dr. Fox has the right, as stated, to disagree with the TANKS methodology, but it is a methodology that is widely accepted in the industry, and by BAAQMD, and therefore provides a substantial evidence basis for assessment of tank emissions.

Dr. Fox also seems to be unaware of local regulations that have the effect of requiring stabilization of certain crude oils stored in external floating roof tanks, such as the tanks used at the Benicia Refinery. Specifically, BAAQMD Regulation 8-5 limits the vapor pressure of crude oil stored in external floating roof tanks to less than 11 psi. To comply with this requirement, crudes stored at the Refinery undergo a stabilization process that removes the low molecular weight hydrocarbon components from the crude. The process minimizes flashing vapors while the crude liquid is being stored. Because of such regulatory requirements, any higher vapor pressure crudes must be "stabilized" prior to transport by rail.

(e) Wastewater Processing Emissions

According to Dr. Fox, a layer of crude oil forms in the water draw surge tank, as a result of which during the processing of waste waters ROGs and TACs are emitted. She also contends that increased vapor pressures would increase the need for water draw, and therefore increase the resulting emissions.

First, for the reasons already stated, tank emissions are not relevant, since tanks are being neither added nor modified for the CBR Project, and Valero is not proposing to store any crudes it is not already authorized to store. Even if tank emissions were relevant, all material from tank dewatering is stored and

processed in compliance with all of Valero's Title V permit conditions and BAAQMD regulations, which do ***not*** vary depending upon the vapor pressure of the crude. Again, Dr. Fox has the right to disagree with the Title V permit conditions, but compliance with such conditions constitutes adequate mitigation for CEQA compliance. In addition, Valero's Title V permits were issued a long time ago, and the statute of limitations for challenging those permit conditions has long since expired.

3. Rail Car Unloading Emissions

Dr. Fox contends that the FEIR's treatment of rail unloading emissions is inadequate, mainly because, as contrasted with the EIR for the Phillips 66 CBR project, the Valero CBR FEIR does not discuss any air elimination system for mitigation/elimination of the risk of explosion for downstream equipment.

Dr. Fox apparently overlooked the DEIR treatment of air elimination for the CBR Project. As set forth at page 3-21 of the DEIR, the Project eliminates air entrainment by using equalization piping between the railcars and the pump suction piping. This is the same system installed and used at other Valero facilities. This air elimination system ensures accurate crude flow measurement, which is precisely the same purpose served by the Phillips 66 air elimination system. Both the Valero system and the Phillips 66 system, to the degree that air may contribute to an explosion (Dr. Fox, in any event, has identified no potential source of ignition), will therefore reduce such risk. And there is no reason whatsoever to believe that the air elimination system to be employed by Phillips 66 is any more effective in that regard than the system to be employed by Valero.

4. Sump Emissions

Dr. Fox contends that the EIR fails to account for emissions from sump spills.

Sump spills are not a normal part of operations, and are not separately accounted for, as they are entirely speculative. If, however, a spill were to occur during offloading operations, Valero personnel would immediately remediate the spill. Remediation includes clearing the crude rail offloading sump of any accumulated VOCs, as is similarly done to address general refinery VOC spills.

There are, moreover, currently no industry or BAAQMD standards or methodologies in existence that separately account for sump emissions in the unlikely event of a spill. Neither are there any relevant thresholds of significance. In the absence of such standards, methodologies or thresholds, CEQA does not require a separate evaluation of such impacts.

5. Rail Car Fugitive Emissions

Dr. Fox contends that rail cars are not "vapor-tight." Because there will be "free space" at the top of the car that provides space for entrained gasses to be released, those emissions, she claims, must be accounted for.

The City has no authority to regulate rail operations because of federal preemption. The Code of Federal Regulations addresses rail car safety and emissions. Title 49 C.F.R. § 173.24 provides that "closures on packagings shall be so designed and closed that under conditions (including the effects of temperature, pressure and vibration) normally incident to transportation . . . (ii) [t]he closure is leakproof and secured against loosening." This regulation also requires that each rail car be inspected for tightness prior to releasing it to the railroad for transport.

Finally, Dr. Fox's comment that the EIR fails to account for rail car vapor during offloading is incorrect. Offloading emissions are accounted for at Table 4.1-5, page 4.1-19 of the DEIR. In addition, the DEIR discusses how offloading vapors will be minimized. Specifically, at page 3-21, the DEIR notes that a check valve would be installed onto each vent valve on the top of each tank car. The valve would be opened, and the accompanying check valve would allow only fresh air into each tank car, and prevent release of hydrocarbon fugitive emissions to the atmosphere.

6. Conclusion

The environmental review for the CBR Project has taken far longer than it should have, primarily because of the review of the impacts of rail operations, a review preempted by federal law. What has been revealed by nearly four years of painstaking, microscopic environmental review of the impacts of Valero's unloading rack is that the rack will in fact have no significant, unmitigated environmental effects, and that there are no legal or factual grounds on which to base a denial of Valero's application. We ask you to base your decision not on ideology or on heated rhetoric, but on the law and the facts, which compel the granting of our appeal, the certification of the CBR FEIR, and the approval of a use permit for the construction and operation of our proposed CBR Project.

Thank you very much for your consideration of our letter.

Very truly yours,

Donald Cuffel

Donald Cuffel
Director Environmental, Health, Safety, &
Community/Government Affairs

Attachment

Appendix 1: A Discussion of Blended Crude Properties and Emissions from Operations

The Valero Benicia refinery blends a variety of crude oils as the first step in the refining process. The blended crude attributes must be within a specific range of several parameters in order to safely store and process the blended crude in an environmentally compliant manner. The BAAQMD and EPA have imposed permit limits on crude tank throughput and true vapor pressure, refinery fuel gas sulfur, refinery unit throughputs and production rates along with many other operating variables. All of these limits must be respected and met concurrently, and whichever one is reached first becomes the limiting variable for that particular crude blend. Furthermore, a physical constraint may be reached before any permit limit is reached; and in that case, the physical constraint becomes the limiting factor.

The graphical representation of blended crude appears in Figure 1. The x-axis is API gravity with heavier crudes (lower gravity) to the left and lighter crudes (higher gravity) to the right. The y-axis is the sulfur content of the crude on a weight percent basis with higher sulfur crudes toward the top of the graph. The yellow box defines the outer boundary of sulfur/API combinations that, at least in theory, the Refinery could run based on the design of the installed processing equipment.

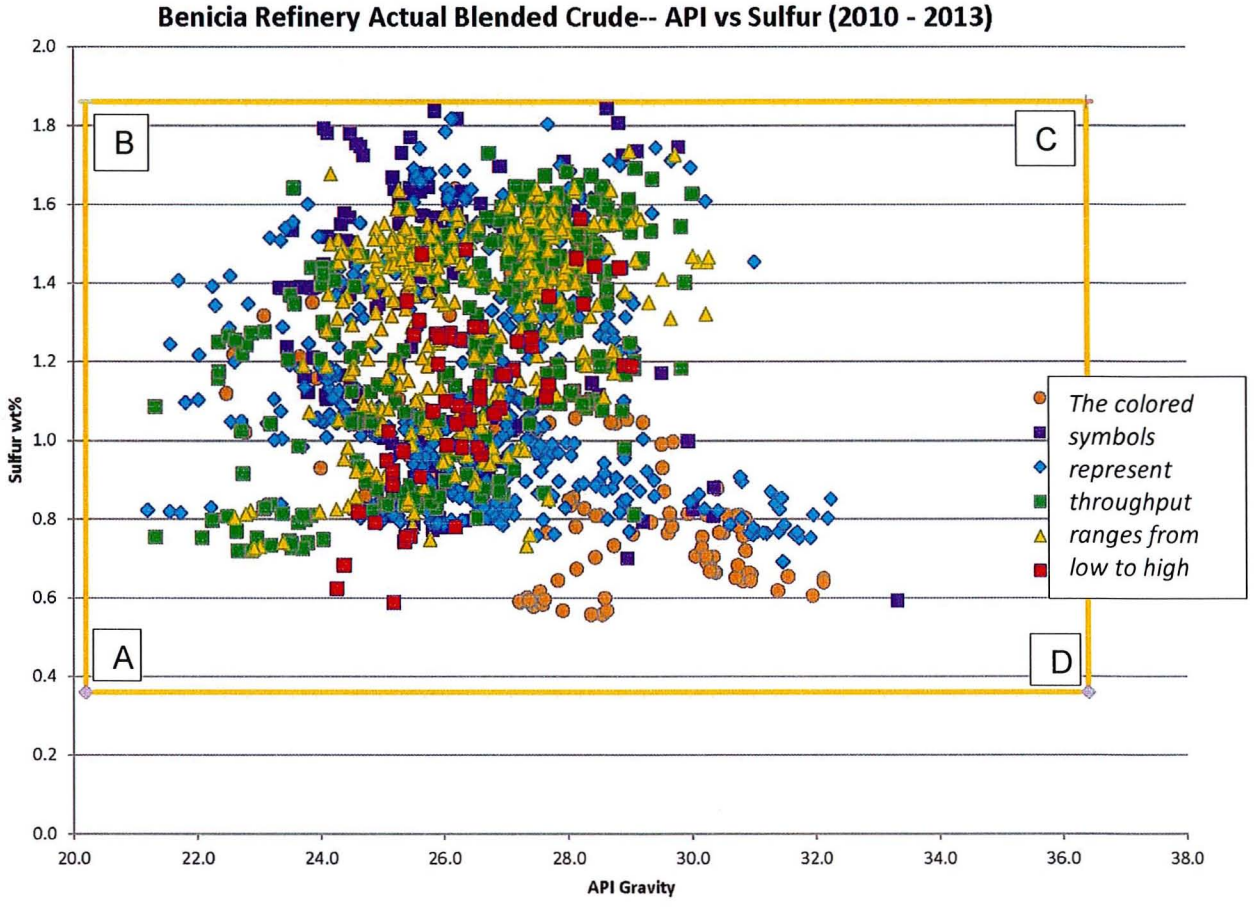

Figure 1 A graphical representation of blended crude based on the maximum production rate achieved for given levels of sulfur and API.

Each of the four corners of the graph represent increasingly tighter constraints as follows:

A: Low gravity (heavy crude) and low sulfur (sweet crude)
B: Low gravity (heavy crude) and high sulfur (sour crude)
C: High gravity (light crude) and high sulfur (sour crude)
D: High gravity (light crude) and low sulfur (sweet crude)

The colored markers (boxes in purple, green and red; beige circles; orange triangles; and blue diamonds) indicate actual blended API/Sulfur crude characteristics *and the production rate while running that specific blend*. The distribution of the markers are indications of the processing capabilities of the refinery for the various crude blends, and a *de facto* indication of the constraints on throughput (production capacity) that crude qualities impose.

When the crude blend trends toward the A or B corners of the chart, the blend is a heavier crude with varying amounts of sulfur. Near corner A, the practical limit is the Fluid Coker which refines the bottom of the barrel, the heaviest fractions in the crude oil. The refinery's total production capacity is limited by the simple fact that when the Fluid Coker is "full", no additional crude can be processed. Said another way, when the heavy oil piping and equipment in the refinery are at their maximum operating capacity, additional crude cannot be introduced at that specific API/Sulfur combination. (See green boxes near corner A indicating a heavy/sweet crude blend.)

When the crude blend trends toward the B corner of the chart, sulfur removal from fuel gas becomes the limiting factor because of a finite treatment capacity. Notice how the green boxes (which indicate production rates of between 120 and 130 thousand barrels per day) for API 22 crude blend are not uniformly distributed vertically in the chart. As the sulfur content increases above 1.2 wt% in the crude blend, the green box population trends to the right indicating a lighter gravity blend is necessary to support the same production capacity. Following the pattern of the green boxes demonstrates the real-world trade-off between crude gravity and sulfur. Similarly, the purple boxes (which indicate a reduced throughput of between 100 and 110 thousand barrels per day) are clustered primarily in the high sulfur portion of the chart indicating that the sulfur handling limit restricts refinery production capacity to a greater degree than API gravity.

The beige circles (for production rates below 100 thousand barrels per day) that appear in the lower right (light crude/low sulfur) show that naphtha, or "light ends", handling becomes the constraint on production rate. Just the opposite of the "full Coker" case is the "full light ends" case where the equipment and piping handling the lightest components are full and no additional crude can be processed at those API/Sulfur combinations.

Examining each colored marker group in turn confirms that refinery production capacity is constrained by the aggregate effect of the API/Sulfur combination in the blended crude as well as physical limitations of the refinery equipment.

There are two important conclusions from this observation:

1. For a given production rate, there is a narrow range of API/Sulfur combinations in the crude blend that will sustain safe, reliable and compliant operations;
2. The maximum throughput (red squares) can be obtained in a very narrow range of API/Sulfur, and certainly not toward the edges or corners of the chart.

Opponents of Crude by Rail (CBR) have argued that changes in crude slate will necessarily result in increased emissions over baseline from refinery processes. However, these arguments failed to consider

the real-world constraints placed on production rates, and thus emissions. While it is true that many factors affect total emissions such as catalyst activity, heat exchanger fouling and other thermal/chemical characteristics, it is also true that increased production rates means greater consumption of fuel gas in refinery heaters and boilers as well as increased tank roof movement, all of which lead to higher emissions. The relationship between throughput and emissions is indisputable. And the relationship between crude blend qualities and maximum possible throughput is also indisputable, as demonstrated by Figure 1.

Using fuel gas consumed and throughput (production rates) as a proxy for refinery emissions, the relative emissions ranking for various points on the chart can be ranked from high to low. For the table below, the total refinery fuel gas consumed is the basis for the "Combustion" ranking, and the combined throughput of the three major units, Pipestill (crude unit), FCCU and Fluid Coker is used for the "Rate" ranking. The average of the two rankings reveals the highest emissions scenario (Final Rank of 1) to the lowest (Final Rank of 8). Figure 2 shows the location of the points for each throughput/crude blend/emission scenario.

Point on Figure 2	Scenario Description (API / Sulfur / throughput / location / marker	Rate	Combustion	Final Rank
1	Medium gravity / medium sulfur, medium throughput close to center of chart (blue diamond)	2	3	3
2	Light / sweet case, low throughput far right hand (purple square)	6	5	5
3	Heavy / sweet case, medium throughput (blue diamond)	3	1	2
4	Medium gravity / sweet, highest throughput close to center of chart (red square) **HIGHEST EMISSIONS CASE**	1	2	1
5	Light / sour, low throughput close to top of chart (purple square)	5	7	6
6	Light / sour, low throughput close to top of chart (purple square) **LOWEST EMISSIONS CASE**	8	8	8
7	Heavy / sour, medium throughput (blue diamond)	4	4	4
8	Light / sour, low throughput close to top of chart (purple square)	7	6	7

In order of ***highest to lowest*** emissions, the points are: 4, 3, 1, 7, 2, 5, 8, 6. The data show that the highest emission cases are the higher production rate cases near the center of the chart, while the lowest emissions cases are near the extreme edges of the chart, and correlate with lower throughput.

The data also invalidate the CBR opponents' argument that "extreme crudes" (those with very high or low gravities and/or high or low sulfur) delivered by rail will necessarily increase refinery emissions over the baseline. What is true is that emissions are highest when the crude blend is near the center of the API/Sulfur range because the throughput is highest (red squares).

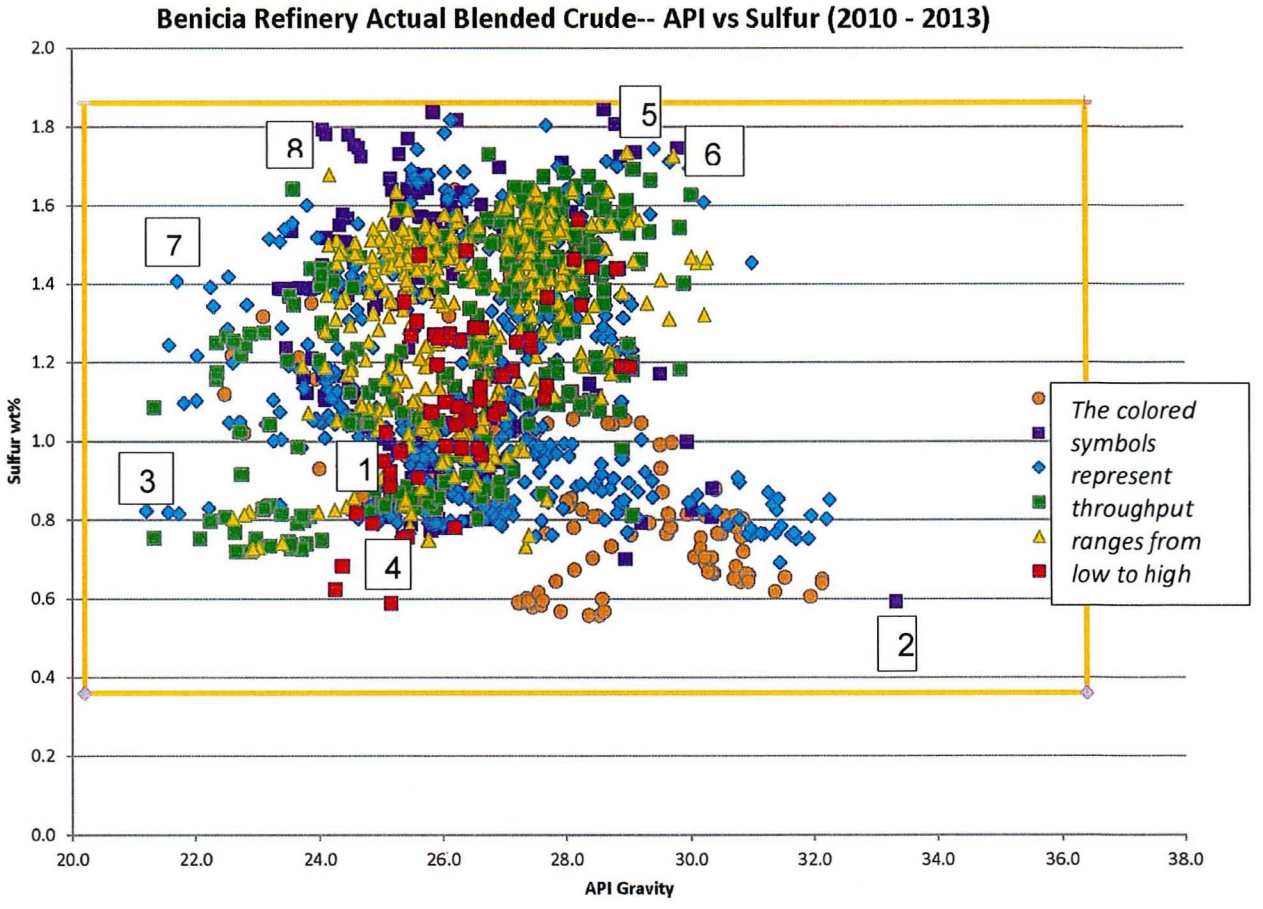

Figure 2 Eight specific operating scenarios are ranked by their relative emissions with Point #4 being the highest, and Point #8 the lowest.