

Premcor Delaware City Refinery

DCR Upgrade and Optimization Project (UOP)

Public Hearing to Discuss Draft Air Permits

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*Tom Godlewski
Sr. Environmental Engineer
Delaware City Refinery*

- ❑ Valero DCR Personnel

- **Tom Godlewski, Valero DCR, Sr. Environmental Engineer**

- **Andrew Woerner, Environmental Resources Management**

- **Patrick Covert, Valero DCR Health, Safety & Environmental Director**

- ❑ Crude Unit Optimization
- ❑ Fluidized Coking Unit (FCU) Optimization
- ❑ LPG Propylene Dryer and Splitter Installation
- ❑ Sour Water Stripper System (SWS) Upgrade
- ❑ Diglycolamine (DGA) Scrubbing System Upgrade

- ❑ Production of refinery grade propylene halted at DCR in 2003
- ❑ Recommission a production skid which removes water and sulfur compounds from production propylene
- ❑ No emission points associated with this unit
 - “Fugitive” emissions
 - Product Loading emissions

Approval proposed by DNREC in FCU Construction Permit

- ❑ **Sour water is a byproduct of the refining process**
 - Refers to water containing hydrogen sulfide and ammonia

- ❑ **A SWS removes the H₂S and Ammonia gases using steam heat.**
 - Gases go to the refinery Sulfur Recovery Plant where 99+% of the sulfur is recovered as product sulfur
 - Stripped water goes to the refinery wastewater treatment plant for processing

- ❑ **No emissions sources associated with the SWS**

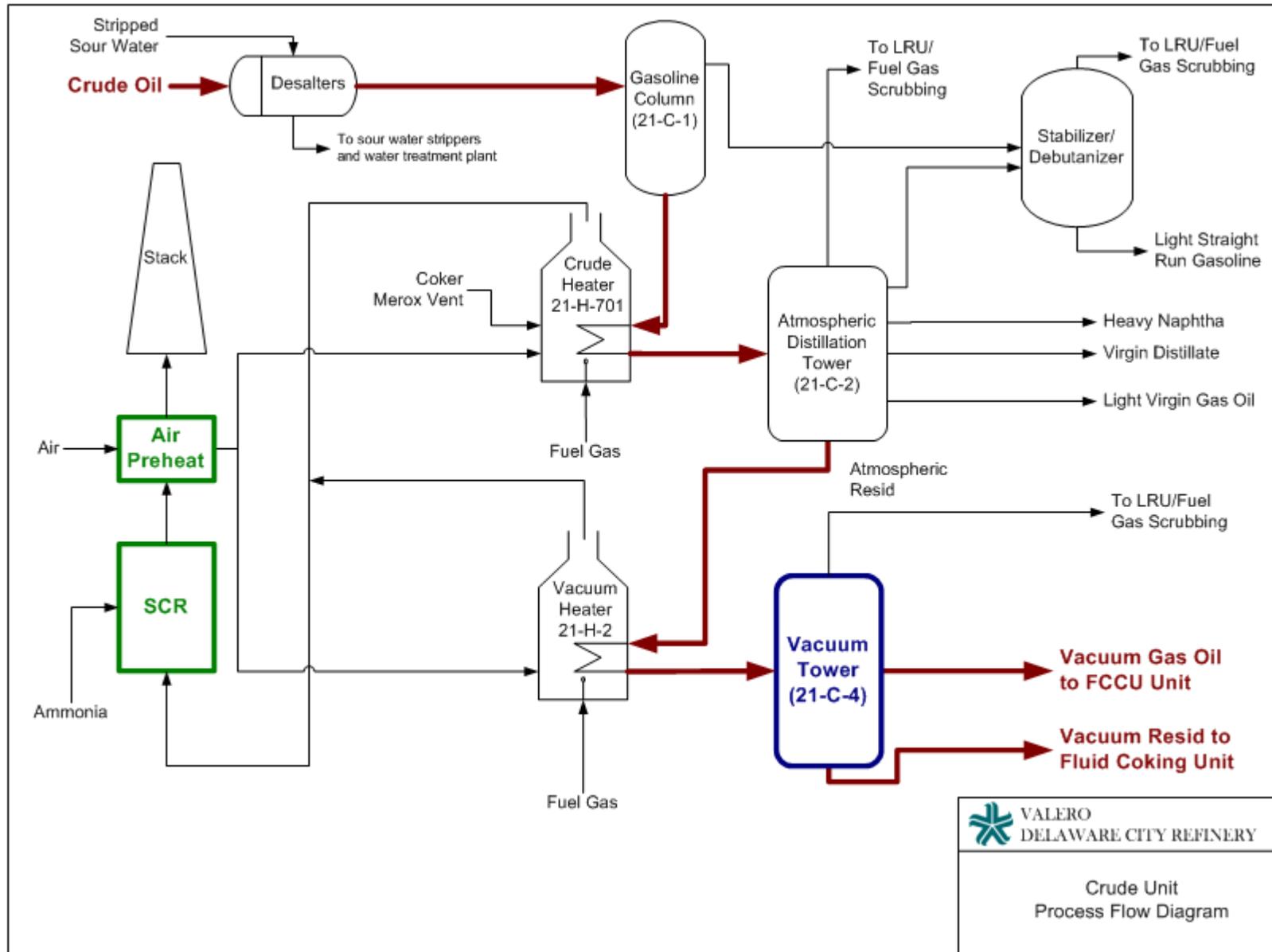
Approval to be granted via the “Registration” Process
(For sources less than 10 lb/day emissions)

- ❑ Diglycolamine is used to “clean” the refinery fuel gas prior to being burned in process heaters
- ❑ DGA “scrubs” contaminants from the fuel gas and then must be regenerated for reuse
- ❑ Project seeks to improve the quality of the DGA after regeneration (greater solids filtration, greater hydrocarbon removal) to reduce operational costs and improve system reliability
- ❑ No emissions points associated with the DGA system
 - “Fugitive sources”

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- ❑ **No change in operating throughput restrictions / Feedstock Flexibility**
 - 191,000 BPD for the Crude Unit
 - 57,100 BPD for the Coker
- ❑ **“Full Range” Crudes vs “Topped” Crudes**
 - “Full Range” Crudes Contain:
 - 1) Gasoline
 - 2) Diesel
 - 3) Heavier stocks (Vacuum Gas Oil and Vacuum Resid)
 - “Topped” Crudes Contain:
 - Heavier stocks only (Cat Cracker and Coker feed)
- ❑ **Are “Topped” Crudes somehow “Dirtier”?**
 - Topped crude purchased today produce feeds of comparable quality to VGO/Resid produced from typical crude oils processed by the DCR

Crude Unit Simplified Block Diagram



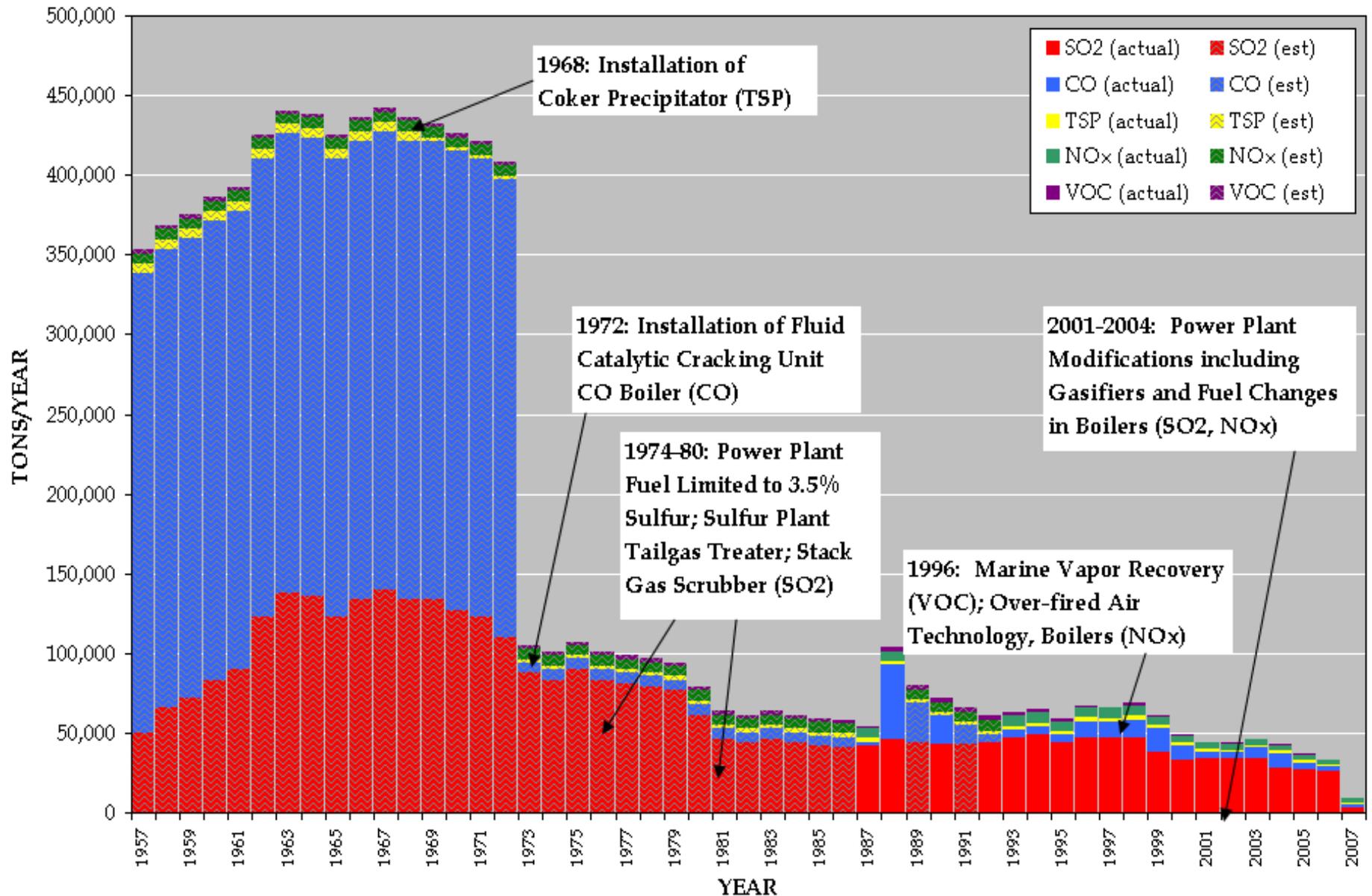
“Actual to Potential” Emissions Impacts

❑ Difference between past actual emissions and requested permit limit

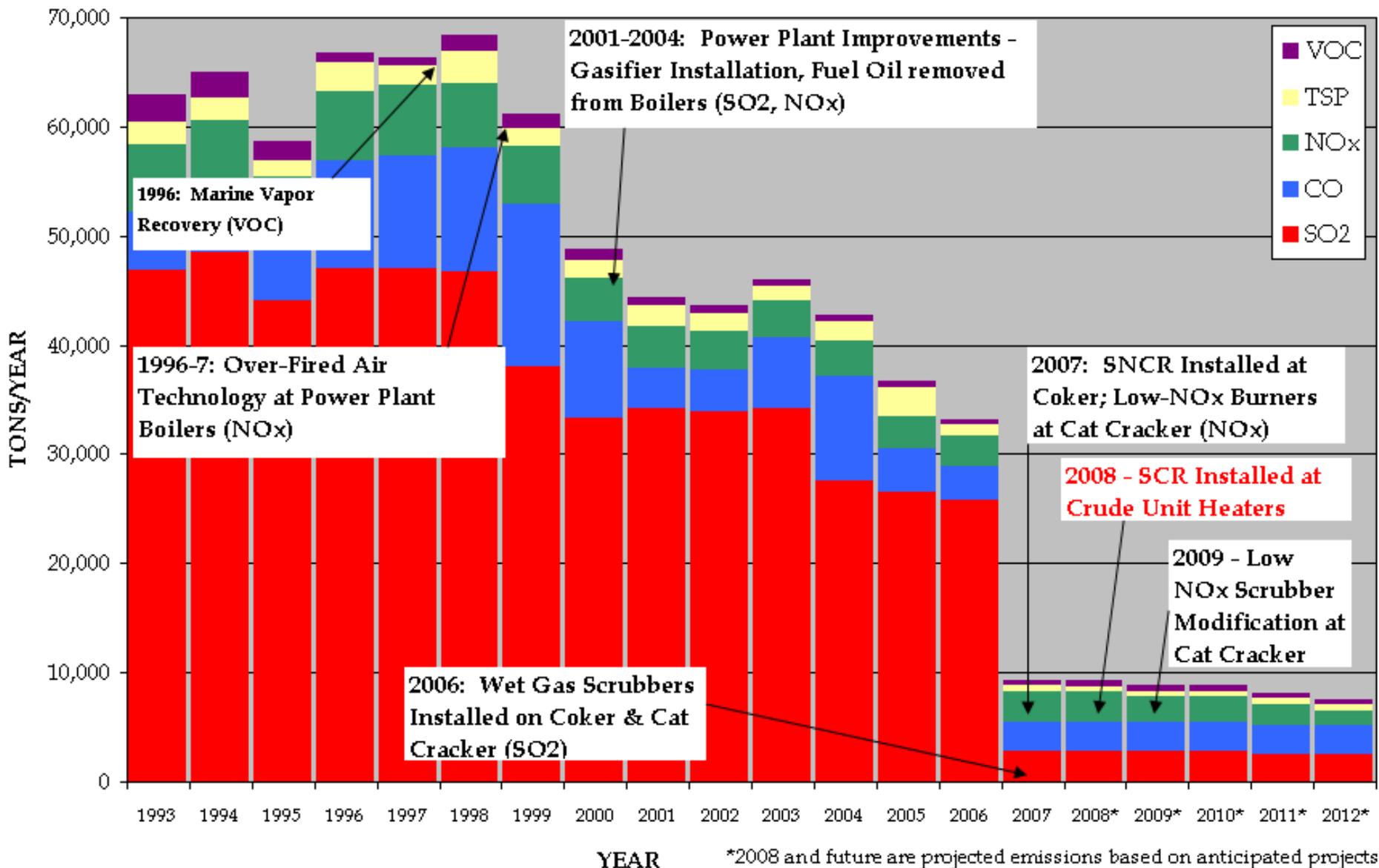
Source	NO _x	SO ₂	VOC	CO	PM/PM ₁₀	H ₂ SO ₄	Pb
Crude Unit Heaters	-58.8*	55.3	6.8	89.5	37.4 / 37.4	2.2	0.0011
Crude Unit Fugitives	NA	NA	0.3	NA	NA	NA	NA
FCU	15.3	8.3	0.9	4.1	60.5/-20.5	43.4	0.052
Total UOP Fugitives	NA	NA	5.34	NA	NA	NA	NA
SRP Impacts	1.7	13.8	0.02	0.09	2.28/2.28	0.27	NA
Cooling Tower	NA	NA	0.5	NA	0.27/0.27	NA	NA
TOTALS	-41.8*	77.4	13.8	93.6	109.2/ 28.3	45.8	0.053
EPA / DNREC Significance Levels	25	40	25	100	25 / 15	7	6
Significance?	No	Yes	No	No	Yes / Yes	Yes	No

- ❑ **DNREC Presentation Deals with “Significance” on a Regulatory Basis**
 - Emissions increases are “significant” with respect to SO₂, H₂SO₄ and PM
- ❑ **Look at “Bigger Picture” = Is there a rising trend?**
 - 5 Year “Contemporaneous Look-back”
 - Contemporaneous Look-back shows “credible decreases” for H₂SO₄ and PM as a result of the installation of the two Wet Gas Scrubbers
- ❑ **Note: While not creditable for regulatory netting or offsetting, the installation of the Wet Gas Scrubbers reduced SO₂ emissions from the refinery by ~ 30,000 tons per year (UOP increase is less than 1% of this recent reduction)**
 - Prevention of Significant Deterioration Modeling done to evaluate impacts of SO₂ increase

DCR Historical Emissions



DCR Recent Historical Emissions



Comparison with 2007 Actual Emissions

Pollutant	PTE – PA (TPY)	% Increase
SO ₂	77.4	2.7
VOC	13.8	3.0
CO	93.6	3.6
PM ₁₀ (inc PM + H ₂ SO ₄)	28.3	5.1

Emissions are Projected to be Below Future Allowable Levels