

**ENGINEERING EVALUATION REPORT
SHELL OIL PRODUCTS
PLANT NO. 11
APPLICATION NO. 25198**

INTRODUCTION

This application is to bank Interchangeable Emission Reduction Credits (IERCs), in accordance with District Regulation 2, Rule 9, from the sources listed below at the Shell Martinez Refinery in Martinez, CA.

S-1507	CO Boiler #1
S-1509	CO Boiler #2
S-1512	CO Boiler #3

The emission reductions are the result of combustion modifications to CO Boilers No. 1, No. 2, and No. 3 that occurred on June 8, 1999, April 29, 1999, and October 28, 1998, respectively. Shell has already banked IERCs from these sources for the initial credit generation periods (CGP₁) immediately following the combustion modifications to each source. IERCs from CO Boilers 1, 2, and 3 have previously been banked under application numbers 27765, 439, 1820, 6979, 10368, 14858, 16772, and 21415.

This application is to bank IERCs from all three CO Boilers for the following credit generation periods:

July 1, 2009 through June 30, 2010
July 1, 2010 through June 30, 2011
July 1, 2011 through June 30, 2012

IERCs for this application are calculated using the same baseline periods that were used in the previous IERC banking applications.

IERC CALCULATIONS

The procedure for calculating IERCs is described in Regulation 2, Rule 9, Sections 602 and 603. The IERC calculations to follow are based on daily NO_x CEM concentrations, NO_x emissions, and steam production rates provided by Shell. Baseline data used in this application is the same data used in previous IERC applications from Shell. The data for each CGP was provided by Shell in this banking application. District staff audited this data by comparing it with data previously submitted by Shell as part of monthly emission reports for the CO Boilers, as required by the Clean Fuels Project permit conditions, for select months during the credit generation periods.

Determine Baseline Period:

The baseline periods were already determined in the original IERC banking applications for the CO Boilers. The baseline periods and credit generation periods (CGPs) for the CO Boilers are summarized in Table 1. ***The credit generation periods for this current IERC banking application are highlighted in bold italics print.***

Table 1 – CO Boiler Baselines and Credit Generation Periods

	COB 1	COB 2	COB 3
Baseline	6/8/94 – 6/7/99	4/29/94 – 4/28/99	11/7/93 – 11/6/98
CGP₁	6/8/99 – 9/26/99	4/29/99 – 9/26/99	11/7/98 – 4/30/99
CGP₂	9/27/99 – 8/27/00	9/27/99 – 8/27/00	5/1/99 – 4/30/00
CGP₃	8/28/00 – 6/30/01	8/28/00 – 6/30/01	5/1/00 – 8/27/00
CGP₄	7/1/01 – 6/30/02	7/1/01 – 6/30/02	8/28/00 – 6/30/01
CGP₅	7/1/02 – 6/30/03	7/1/02 – 6/30/03	7/1/01 – 6/30/02
CGP₆	7/1/03 – 3/31/04	7/1/03 – 3/31/04	7/1/02 – 6/30/03
CGP₇	4/1/04 – 6/30/04	4/1/04 – 6/30/04	7/1/03 – 3/31/04
CGP₈	7/1/04 – 6/30/05	7/1/04 – 6/30/05	4/1/04 – 6/30/04
CGP₉	7/1/05 – 6/30/06	7/1/05 – 6/30/06	7/1/04 – 6/30/05
CGP₁₀	7/1/06 – 6/30/07	7/1/06 – 6/30/07	7/1/05 – 6/30/06
CGP₁₁	7/1/07 – 6/30/08	7/1/07 – 6/30/08	7/1/06 – 6/30/07
CGP₁₂	7/1/08 – 6/30/09	7/1/08 – 6/30/09	7/1/07 – 6/30/08
CGP₁₃	7/1/09 – 6/30/10	7/1/09 – 6/30/10	7/1/08 – 6/30/09
CGP₁₄	7/1/10 – 6/30/11	7/1/10 – 6/30/11	7/1/09 – 6/30/10
CGP₁₅	7/1/11 – 6/30/12	7/1/11 – 6/30/12	7/1/10 – 6/30/11
CGP₁₆			7/1/11 – 6/30/12

Per Regulation 2, Rule 9, Section 602 (Reg. 2-9-602), the baseline period for a source is the 5-year period immediately preceding the initial credit generation period. The initial credit generation period is determined by the completion date of the *first* IERC banking application. IERC banking applications 439 (CO Boilers 1 and 2) and 27765 (CO Boiler 3) were deemed complete on October 20, 1999, and September 3, 1999, respectively. Per Reg. 2-9-204, the initial credit generation period “shall not be more than 30 months prior to the submittal of the first complete IERC banking application for a particular emission reduction activity”. The baseline and initial credit generation periods in Table 1 satisfy the requirements of Section 2-9-204.

Baseline Information:

The original baseline data is summarized in Table 2. This is the same baseline data that was used for all previous IERC banking applications for the CO Boilers.

Table 2 – Original IERC 5-Year Baseline Data

		CO Boiler 1 6/8/94 – 6/7/99	CO Boiler 2 4/29/94 – 4/28/99	CO Boiler 3 11/7/93 – 1/6/98
Ave. NOx Emissions	lb/hr	84.96	84.31	80.46
Ave. Steam Production	kib/hr	122.88	124.11	126.37
NOx/Steam ratio	lb/kib	0.691	0.679	0.637

Determine Baseline Throughputs:

Baseline throughput is the lesser of actual throughput or permitted throughput during the baseline period. Since none of the CO Boilers has a permit condition that limits throughput, the actual throughput is used. Average NOx emissions and throughput rates are summarized for the baselines in Table 2 above.

Determine Baseline Emissions:

From Table 2, the average hourly NOx emission rates over the respective baseline periods are:

- CO Boiler 1 84.96 lb/hr
- CO Boiler 2 84.31 lb/hr
- CO Boiler 3 80.46 lb/hr

Baseline emissions are calculated by multiplying the hourly NOx emission rate by 8,760 hr/year.

CO Boiler 1 (84.96 lb/hr) (8,760 hr/yr) / (2,000 lb/ton) = 372.1 tons/yr

CO Boiler 2 (84.31 lb/hr) (8,760 hr/yr) / (2,000 lb/ton) = 369.3 tons/yr

CO Boiler 3 (80.46 lb/hr) (8,760 hr/yr) / (2,000 lb/ton) = 352.4 tons/yr

These are the baseline emissions used for previous IERC banking applications. However, these emissions must be reduced for this banking application, as discussed below.

Determine the Baseline-Adjusted Emissions (A):

The District cannot approve IERCs for an emission reduction that is required by a District rule, RACT, BARCT, etc. during a given credit generation period. To prevent this, the baseline emission rate must be adjusted (reduced) to reflect any rule or provision that is in effect during the credit generation period. Since requirements may change over time, it is possible to have different baseline adjusted emission rates for different credit generation periods.

CGPs of 7/1/09 – 6/30/10 (365 days) and CGP of 7/1/10 – 6/30/11 (365 days):

Reg. 9-10-304 became effective on July 1, 2002. This Section limits NOx from CO Boilers to 150 ppm (at 3% O₂). This limit was in effect during each of the CGPs in this application. Therefore, we must adjust the baseline emission rate to account for the 150 ppm NOx standard.

To make the adjustment, the original CO Boiler baseline data was reviewed. For any day during the 5-year period baseline period when the average NOx concentration was greater than 150 ppm, staff adjusted (reduced) the daily NOx emissions. This was done by multiplying the actual emissions (lb/hr) by the ratio of the NOx concentrations. For example, if the actual daily NOx concentration was 185 ppm and the daily NOx emissions were 90 lb/hr, the adjusted NOx emissions were calculated as follows:

$$\text{Example NOx adjustment to 150 ppm: } (150 \text{ ppm}/185 \text{ ppm}) (90 \text{ lb/hr}) = 73.0 \text{ lb/hr}$$

This calculation was performed for each day during the baseline period that has a concentration greater than 150 ppm. Table 3 summarizes the revised baseline data, after adjusting for 150 ppm.

Table 3 – Baseline Data Adjusted for 150 ppm NOx Standard

	Baseline Adjusted NOx Emissions (lb/hr average)					5-Yr Ave.
	Year 1	Year 2	Year 3	Year 4	Year 5	
COB 1	88.47	73.27	75.72	72.78	70.85	76.22
COB 2	86.79	76.69	74.75	64.62	77.21	76.01
COB 3	81.32	82.00	69.46	57.86	75.79	73.29
Average	85.53	77.32	73.31	65.09	74.62	

In addition to the NOx standard in Reg. 9-10, the CO Boilers are subject to a permit condition (ID# 12271, Part 85) limiting total emissions from all three boilers to 5,452 lb/day, annual average. This condition limit was reduced from the previous limit of 6,770 lb/day to account for the 150 ppm NOx standard for CO Boilers in Reg. 9-10-304, which became effective on 7/1/02. This new condition limit is equivalent to 75.72 lb/hr for each boiler [(5,452 lb/day / 24 hr/day) / 3]. Because this permit condition limit has been reduced, we must also adjust the IERC Baseline data to account for this lower limit. This adjustment is made as follows. In Table 3, for any year in which the average emissions for all 3 boilers was greater than 75.72 lb/hr, staff substituted 75.72 lb/hr for each CO Boiler for that year. This is the case for Years 1 and 2. Table 4 contains the adjusted baseline data.

Table 4 – Baseline Data Adjusted for 150 ppm NOx AND 5,452 lb/day NOx Limit

	Baseline Adjusted NOx Emissions (lb/hr average)					
	Year 1	Year 2	Year 3	Year 4	Year 5	5-Year Ave.
COB 1	75.72	75.72	75.72	72.78	70.85	74.16
COB 2	75.72	75.72	74.75	64.62	77.21	73.60
COB 3	75.72	75.72	69.46	57.86	75.79	70.91
Average	75.72	75.72	73.31	65.09	74.62	

Using the 5-year average emission rates from Table 4, the baseline-adjusted emissions (A_x where x represents the CGP number) for each CO Boiler are:

$$A_{13,14} \text{ (COB 1)} (74.16 \text{ lb/hr}) (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) = \mathbf{324.8 \text{ tons NOx/yr}}$$

$$A_{13,14} \text{ (COB 2)} (73.60 \text{ lb/hr}) (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) = \mathbf{322.4 \text{ tons NOx/yr}}$$

$$A_{14,15} \text{ (COB 3)} (70.91 \text{ lb/hr}) (8,760 \text{ hr/yr}) / (2,000 \text{ lb/ton}) = \mathbf{310.6 \text{ tons NOx/yr}}$$

Note that the above calculation of baseline-adjusted emissions is identical to that used in previous applications.

CGP of 7/1/11 – 6/30/12 (366 days):

On May 22, 2012 the District approved Shell’s application (number 22287) to add NOx concentration limits on each CO Boiler as required by Shell’s EPA Consent Decree. The limits are specific to each CO Boiler, and there is a rolling 24 hour limit and a rolling 365 day limit on each boiler. The limits were approved as a minor revision to Shell’s Title V Permit effective 5/22/12. The limits are expressed at 0% O₂ in the permit as shown in Table 5.

Table 5 – EPA Consent Decree Limits on CO Boilers at 0% O₂

CO Boiler	Rolling 24 hour NOx Limit (ppm at 0% O ₂)	Rolling 365 day NOx Limit (ppm at 0% O ₂)
COB 1	168.4	130.6
COB 2	156.9	127.4
COB 3	142.7	113.1

To convert these limits to 3% O₂ (the same basis as the District limits), multiply the concentration at 0% by $(20.95-3)/20.95 = 0.857$. The converted limits are shown in Table 6.

Table 6 – EPA Consent Decree Limits Converted to 3% O₂

CO Boiler	Rolling 24 hour NOx Limit (ppm at 3% O ₂)	Rolling 365 day NOx Limit (ppm at 3% O ₂)
COB 1	144.3	111.9
COB 2	134.4	109.2
COB 3	122.3	96.9

The limits in Table 6 affect the baseline emissions for the CGP of this application covering the period from 7/1/11 – 6/30/12. The baseline emissions used for this CGP were adjusted to reflect the new limits. To make this adjustment the baseline data was reviewed on a daily basis and lowered for any day the actual emissions were greater

than the new daily limits. The annual average NOx for each year during the baseline was also lowered to the new annual average NOx limit. The 5-year average baseline adjusted data for IERC calculations based on these new limits over an entire credit generation period is summarized in Tables 7 and 8.

Table 7 – Baseline Data Adjusted for Rolling 24 hour NOx Limits in Table 6

	Baseline Adjusted NOx Emissions (lb/hr average)					5-Yr Ave.
	Year 1	Year 2	Year 3	Year 4	Year 5	
COB 1	85.22	72.14	74.96	70.69	68.78	74.36
COB 2	78.04	71.93	71.01	59.92	70.50	70.28
COB 3	66.73	67.75	64.22	54.05	65.07	63.56
Average	76.66	70.60	70.06	61.55	68.12	

Table 8 – Baseline Data Adjusted for Rolling 365 day NOx Limits in Table 6

	Baseline Adjusted NOx Emissions (lb/hr average)					5-Yr Ave.
	Year 1	Year 2	Year 3	Year 4	Year 5	
COB 1	66.17	62.89	64.69	61.61	59.65	63.00
COB 2	63.44	61.62	65.02	56.82	62.78	61.93
COB 3	56.58	53.94	54.10	53.36	54.38	54.47
Average	62.06	59.48	61.27	57.26	58.93	

Using the 5-year average emission rates from Table 8 (because using these rates will result in more conservative [lower] baseline-adjusted emissions than using those from Table 4 or 7), the baseline-adjusted emissions for each CO Boiler are:

COB 1 (63.00 lb/hr) (8,784 hr/yr) / (2,000 lb/ton) = 276.7 tons NOx/yr
 COB 2 (61.93 lb/hr) (8,784 hr/yr) / (2,000 lb/ton) = 272.0 tons NOx/yr
 COB 3 (54.47 lb/hr) (8,784 hr/yr) / (2,000 lb/ton) = 239.2 tons NOx/yr

The limits in Table 6 were only effective for a portion of the CGP from 5/22/12 through 6/30/12 (40 days out of 366). Therefore, the final adjusted baseline emissions for the CGP of this application covering the period from 7/1/11 – 6/30/12 must be prorated to apply the new limits for 40 days (10.9 % of the period) and to use the pre-adjusted baseline emissions for the other 326 days.

A₁₅ (COB 1) (89.1%) (324.8 tons NOx/365 days) (366 days/yr) + (10.9%) (276.7 tons NOx/yr) = **320.3 tons NOx/yr**

A₁₅ (COB 2) (89.1%) (322.4 tons NOx/365 days) (366 days/yr) + (10.9%) (272.0 tons NOx/yr) = **317.7 tons NOx/yr**

A₁₆ (COB 3) (89.1%) (310.6 tons NOx/365 days) (366 days/yr) + (10.9%) (239.2 tons NOx/yr) = **303.5 tons NOx/yr**

Determine the Actual Emissions (B) During the Credit Generation Period:

Actual emissions during each CGP are determined by multiplying the hourly average NOx emissions for the particular CGP by the duration of that CGP. Average NOx emission rates during each CGP were provided by Shell. Staff compared this data with Shell’s monthly reports required by the Clean Fuels Project permit conditions. The emissions in this application are consistent with the data previously submitted by Shell. Tables 9, 10, and 11 summarize the CO Boiler data for the credit generations periods covered by this application.

Table 9 - CO Boiler Data: (7/1/09 – 6/30/10)

	CGP #	NOx Emissions lb/hr	Steam Production klb/hr	Em. rate (NOx/steam) lb/klb
CO Boiler 1	13			
CO Boiler 2	13			
CO Boiler 3	14			

Table 10 - CO Boiler Data: (7/1/10 – 6/30/11)

	CGP #	NOx Emissions lb/hr	Steam Production klb/hr	Em. rate (NOx/steam) lb/klb
CO Boiler 1	14			
CO Boiler 2	14			
CO Boiler 3	15			

Table 11 - CO Boiler Data: (7/1/11 – 6/30/12)

	CGP #	NOx Emissions lb/hr	Steam Production klb/hr	Em. rate (NOx/steam) lb/klb
CO Boiler 1	15			
CO Boiler 2	15			
CO Boiler 3	16			

Actual emissions (B_x where x represents the CGP number) are:

7/1/09 – 6/30/10

B₁₃ (COB 1) = [redacted] = 165.6 tons of NOx

B₁₃ (COB 2) = [redacted] = 165.1 tons of NOx

B₁₄ (COB 3) = [redacted] = 161.6 tons of NOx

7/1/10 – 6/30/11

B₁₄ (COB 1) = [redacted] = 124.8 tons of NOx

B₁₄ (COB 2) = [redacted] = 152.9 tons of NOx

B₁₅ (COB 3) = [redacted] = 179.6 tons of NOx

7/1/11 – 6/30/12 (includes leap year day)

B₁₅ (COB 1) = [redacted] = 118.1 tons of NOx

B₁₅ (COB 2) = [redacted] = 108.9 tons of NOx

B₁₆ (COB 3) = [redacted] = 143.2 tons of NOx

Determine Credit Generation Period Non-Curtailment Emissions (C):

The non-curtailment emissions (C_x where x represents the CGP number) are calculated by multiplying the baseline throughput (steam production rate) by the emission rate (lb NOx / klb steam) for that CGP. Baseline throughputs are in Table 2, and CGP emission rates are in Tables 9, 10, and 11.

7/1/09 – 6/30/10 (365 days = 8,760 hrs)

C₁₃ (COB 1) =
(122.88 klb steam/hr)(0.342 lb NOx/klb steam)(8,760 hr) / (2,000 lb/ton) = **184.1 tons of NOx**

C₁₃ (COB 2) =
(124.11 klb steam/hr)(0.329 lb NOx/klb steam)(8,760 hr) / (2,000 lb/ton) = **178.8 tons of NOx**

C₁₄ (COB 3) =
(126.37 klb steam/hr)(0.362 lb NOx/klb steam)(8,760 hr) / (2,000 lb/ton) = **200.4 tons of NOx**

7/1/10 – 6/30/11 (365 days = 8,760 hrs)

C₁₄ (COB 1) =
(122.88 klb steam/hr)(0.262 lb NOx/klb steam)(8,760 hr) / (2,000 lb/ton) = **141.0 tons of NOx**

C₁₄ (COB 2) =
(124.11 klb steam/hr)(0.297 lb NOx/klb steam)(8,760 hr) / (2,000 lb/ton) = **161.4 tons of NOx**

C₁₅ (COB 3) =
(126.37 klb steam/hr)(0.338 lb NOx/klb steam)(8,760 hr) / (2,000 lb/ton) = **187.1 tons of NOx**

7/1/11 – 6/30/12 (366 days = 8,784 hrs)

C₁₅ (COB 1) =
(122.88 klb steam/hr)(0.256 lb NOx/klb steam)(8,784 hr) / (2,000 lb/ton) = **138.2 tons of NOx**

C₁₅ (COB 2) =
(124.11 klb steam/hr)(0.250 lb NOx/klb steam)(8,784 hr) / (2,000 lb/ton) = **136.3 tons of NOx**

C₁₆ (COB 3) =
(126.37 klb steam/hr)(0.289 lb NOx/klb steam)(8,784 hr) / (2,000 lb/ton) = **160.4 tons of NOx**

Calculate IERCs for the Credit Generation Period:

For a given source and credit generation period, IERCs are calculated by subtracting the greater of either the actual emissions (B) or the non-curtailement emissions (C) from the baseline-adjusted emissions (A).

7/1/09 – 6/30/10

COB 1 (CGP₁₃): IERCs = A₁₃ – C₁₃ = 324.8 tons – 184.1 tons = **140.7 tons of NOx**

COB 2 (CGP₁₃): IERCs = A₁₃ – C₁₃ = 322.4 tons – 178.8 tons = **143.6 tons of NOx**

COB 3 (CGP₁₄): IERCs = A₁₄ – C₁₄ = 310.6 tons – 200.4 tons = **110.2 tons of NOx**

7/1/10 – 6/30/11

COB 1 (CGP₁₄): IERCs = A₁₄ – C₁₄ = 324.8 tons – 141.0 tons = **183.8 tons NOx**

COB 2 (CGP₁₄): IERCs = A₁₄ – C₁₄ = 322.4 tons – 161.4 tons = **161.0 tons NOx**

COB 3 (CGP₁₅): IERCs = A₁₅ – C₁₅ = 310.6 tons – 187.1 tons = **123.5 tons NOx**

7/1/11 – 6/30/12

COB 1 (CGP₁₅): IERCs = A₁₅ – C₁₅ = 320.3 tons – 138.2 tons = **182.1 tons NOx**

COB 2 (CGP₁₅): IERCs = $A_{15} - C_{15} = 317.7 \text{ tons} - 136.3 \text{ tons} = 181.4 \text{ tons NOx}$

COB 3 (CGP₁₆): IERCs = $A_{16} - C_{16} = 303.5 \text{ tons} - 160.4 \text{ tons} = 143.1 \text{ tons NOx}$

IERC Banking Certificate

IERCs are valid for 5 years following the end of the credit generation period. In this banking application there are three time periods during which credit is generated. The IERCs generated in a given time period will be combined into a single IERC Banking Certificate.

IERC Banking Certificate #8-Q (effective 7/1/10, expires 6/30/15)
394.5 Tons of NOx

IERC Banking Certificate #8-R (effective 7/1/11, expires 6/30/16)
468.3 Tons of NOx

IERC Banking Certificate #8-S (effective 7/1/12, expires 6/30/17)
506.6 Tons of NOx

STATEMENT OF COMPLIANCE

For an emission reduction to be banked as an IERC, the reduction must be real, permanent, quantifiable, enforceable and surplus (Section 2-1-301.2).

Real: The emission reductions evaluated in this application are real. There was an actual decrease in emissions to the atmosphere, as is evident from continuous emission monitoring (CEM) data.

Permanent: As defined in Section 2-9-213, permanent means that the emission reduction exists for the duration of the credit generation period (CGP). Since the CGP in this application has already ended, the emission reductions have already occurred, and therefore, are permanent.

Quantifiable: These emission reductions are quantifiable. The emission calculations were performed using NOx CEM and emission data, and steam production data.

Enforceable: As defined in Section 2-9-209, enforceable means that there is credible evidence during the credit generation periods to verify compliance with Regulation 2, Rule 9. The evaluation of this banking application is based on actual steam production data and NOx CEM and emission data.

Surplus: As defined in Section 2-9-218, surplus means that the emission reductions are not required by Reasonably Available Control Technology (RACT), Best Available Retrofit Control Technology (BARCT), or any other rule in effect during the credit generation period. In addition, emissions reductions must exceed any reduction required by the most recent Clean Air Plan or Air Quality Management Plan.

The District is not aware of any EPA guidance on RACT for CO Boilers. In the absence of such guidance, the District considers the 150 ppm NOx limit in Regulation 9, Rule 10, Section 304 to constitute RACT/BARCT for CO Boilers during the credit generation periods of 7/1/09 – 6/30/10 and 7/1/10 – 6/30/11. Emissions during the baseline period the CO Boilers were reduced to reflect this 150 ppm limit.

On May 22, 2012 the District approved Shell's application (number 22287) to add NOx concentration limits on each CO Boiler as required by Shell's EPA Consent Decree. The limits are more stringent than the 150 ppm NOx limit in Regulation 9, Rule 10, Section 304 and are specific to each CO Boiler. The limits affect the baseline emissions for the credit generation period of this application covering the period from 7/1/11 – 6/30/12. Emissions during the baseline period the CO Boilers were reduced to reflect these limits.

The amount of IERCs generated in each calendar year from 2009 through 2011 exceeds the amount of IERCs used in each respective year. In 2012, the sum amount of IERCs in emission inventories exceeds the sum of actual emissions, the IERCs used, and the IERCs generated. Therefore, the IERCs requested in this application are surplus. The details are tabulated in the Appendix of this evaluation report.

PUBLIC COMMENT

The amount of IERCs exceeds 40 tons for at least one of the credit generation periods in this application. Therefore, this application is subject to the public comment provisions of Section 2-9-405. Before approving this banking application, the District must publish a notification of our preliminary decision to approve the IERCs. Following publication, there will be a 30-day public comment period, during which the District will accept written comments.

CEQA

The District will issue a Notice of Exemption for this application. Pursuant to Regulation 2-1-312.10, review of this application to bank emission reductions pursuant to Regulation 2, Rule 9 is exempt from CEQA review because it can be seen with clarity that review and approval of such applications have no potential for causing a significant environmental impact.

RECOMENDATION

Staff recommends the District issue a Notice of Exemption and a public notice for our preliminary decision to approve the following IERCs for emission reductions that occurred at Shell.

IERC Banking Certificate #8-Q 394.5 Tons of Nitrogen Oxides		
<u>Source #</u>	<u>Baseline Period</u>	<u>Credit Generation Period</u>
S-1507 CO Boiler #1	6/8/94 – 6/7/99	7/1/09 – 6/30/10
S-1509 CO Boiler #2	4/29/94 – 4/28/99	7/1/09 – 6/30/10
S-1512 CO Boiler #3	11/7/93 – 11/6/98	7/1/09 – 6/30/10
Effective Date:	July 1, 2010	
Expiration Date:	June 30, 2015	

IERC Banking Certificate #8-R 468.3 Tons of Nitrogen Oxides

<u>Source #</u>	<u>Baseline Period</u>	<u>Credit Generation Period</u>
S-1507 CO Boiler #1	6/8/94 – 6/7/99	7/1/10 – 6/30/11
S-1509 CO Boiler #2	4/29/94 – 4/28/99	7/1/10 – 6/30/11
S-1512 CO Boiler #3	11/7/93 – 11/6/98	7/1/10 – 6/30/11

Effective Date: July 1, 2011
Expiration Date: June 30, 2016

IERC Banking Certificate #8-S 506.6 Tons of Nitrogen Oxides

<u>Source #</u>	<u>Baseline Period</u>	<u>Credit Generation Period</u>
S-1507 CO Boiler #1	6/8/94 – 6/7/99	7/1/11 – 6/30/12
S-1509 CO Boiler #2	4/29/94 – 4/28/99	7/1/11 – 6/30/12
S-1512 CO Boiler #3	11/7/93 – 11/6/98	7/1/11 – 6/30/12

Effective Date: July 1, 2012
Expiration Date: June 30, 2017

By: (Signed by Kevin Oei)
 Air Quality Engineer
Date: 3/25/2013

Appendix - IERC Surplus Determination

PN	Name	S-#	2000				2001				2002				2003			
			NOX Emission Inventory ⁽¹⁾ (Tons)	Actual Emissions ⁽²⁾ (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory ⁽³⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	NOX Emission Inventory ⁽¹⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)
12626	Valero	S-3 S-4	1152.7 648.7	1749.4	554.1	26.5	948.2 532.0	1019.3	1284.2	43.8	587.3 286.3	916.5	960.2	286.9	512.2 249.7	923.1	483.8	421.3
11	Shell	S-1507 S-1508 S-1512	193.5 207.3 214.0	622.9	408.1	56.3	159.2 170.5 176.1	626.1	364.9	44.5	229.4 210.1 237.8	654.6	354.8	290.1	200.1 193.2 74.2	712.1	189.5	368.5
26	Mirant Potrero	S-1	454.1	399.3	70.9	0.0	494.2	447.1	94.2	0.0	142.2	94.8	34.3	0.0	81.9	199.3	0.0	0.0
24	PG&E Hunters Pl.	S-3 S-4 S-5 S-6 S-7	46.4 39.4 49.7 44.4 129.1	272.2	125.2	0.0	50.5 42.9 54.0 48.4 140.5	170.0	124.5	0.0	0.0 0.0 0.0 0.0 99.5	99.5	0.0	0.0	0.0 0.0 0.0 0.0 57.3	107.9	0.0	0.0
16	ConocoPhillips	S-438																
Totals:			3177.5	3043.7	1159.3	82.8	2816.5	2262.4	1867.8	88.4	1792.6	1765.4	1399.3	557.0	1356.6	1942.4	673.3	769.8
PN	Name	S-#	2004				2005				2006				2007			
			"Adjusted" Inventory ⁽³⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory ⁽³⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory ⁽³⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory ⁽³⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)
12626	Valero	S-3 S-4	512.2 249.7	648.9	589.4	507.5	434.5 211.8	770.6	537.2	495.6	434.6 211.8	752	556	507.1	434.6 211.8	688.3	608.7	453.2
11	Shell	S-1507 S-1508 S-1512	200.1 183.2 207.4	739.5	180.9	157.2	169.7 155.5 176.0	698.6	129.0	157.3	169.7 155.5 176	546	316.2	132.3	169.7 155.5 176	618	320.6	27.9
26	Mirant Potrero	S-1	81.9	204.7	0.0	12.8	81.9	43.4	0.0	15.5	no credits used	no credits used	no credits used	no credits used	no credits used	no credits used	no credits used	no credits used
24	PG&E Hunters Pl.	S-3 S-4 S-5 S-6 S-7	0.0 0.0 0.0 0.0 57.3	198.6	0.0	1.1	0.0 0.0 0.0 0.0 57.3	61.7	0.0	62.3	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06	Shut down 5/15/06
16	ConocoPhillips	S-438	49.9	14.1	2.2	0.0	42.4	15.3	6.3	0.0	42.4	15.3	7.3	0.0	42.4	15.4	6.2	4.6
Totals:			1541.7	1905.8	772.5	678.6	1329.3	1589.8	1572.5	730.6	1190	1313.3	879.5	639.4	1190	1301.7	944.5	486.7

Appendix - IERC Surplus Determination

PN	Name	S-#	2008				2009				2010				2011			
			"Adjusted" Inventory ⁽¹⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory ⁽²⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory ⁽³⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory ⁽¹⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)
12626	Valero	S-3	434.6	656.3	617.4	373.3	434.6	599.5	515.8	399.4	459.4	584	548.3	332.2	617.5	624.4	487.5	305.4
		S-4	211.8				211.8				224							
11	Shell	S-1507	169.7	513.8	380.7	5.8	169.7	511.9	218.7	82.2	179.4	445.8	0	724.1	407.3	487.5	1.86	
		S-1509	155.5				155.5				164.3							
		S-1512	176				176				166							
16	ConocoPhillips	S-438	42.4	14.1	5.2	7.1	42.4	14.0	1.4	8.9	44.8	13.6	3.4	15.9	8.6	1.97		
		Totals:	1190.0	1184.2	1003.3	386.2	1190.0	1125.4	735.9	450.5	1257.9	1043.4	548.3	335.6	1357.5	1040.3	487.5	310.2

PN	Name	S-#	2012				2013				2014				2015			
			"Adjusted" Inventory ⁽¹⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory ⁽²⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory ⁽³⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)	"Adjusted" Inventory ⁽¹⁾ (Tons)	Actual Emissions (Tons)	IERCs Generated (Tons)	IERCs Used (Tons)
12626	Valero	S-3	639.3	0		301.1												
		S-4		Shut down														
11	Shell	S-1507	749.6	345	253.3	2.32												
		S-1509																
		S-1512																
16	ConocoPhillips	S-438	15.4	8.6		0.17												
		Totals:	1405.3	353.6	253.3	303.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix - IERC Surplus Determination

Notes:

- (1) 2000 NOx inventory from 2001 Ozone Attainment Plan (OAP) Inventory; 2002 NOx inventory from 2005 Ozone Strategy (3) Adjusted NOx inventories based ratios in subsequent years of respective "Plans"
 2001 Shell & Valero: ratio = 20.4/24.8 for refinery ext. combustion
 PGE/Mirant: ratio = 18.5/17.0 for power plants
 2002 No adjustment, because emissions are based on the 2002 base year for the 2005 Ozone Strategy
 2003-04 Shell, Conoco-Phillips & Valero:
 ratio = (15.5/18.52 for refinery ext. combustion) x (2002 Em. Inventory) / PGE/Mirant:
 ratio = (2.8/4.86 for power plants) x (2002 Em. Inventory)
 2005-09 Shell, Conoco-Phillips & Valero:
 ratio = (14.0/18.52 for refinery ext. combustion) x (2002 Em. Inventory) / PGE/Mirant:
 ratio = (2.8/4.86 for power plants) x (2002 Em. Inventory)
 2010 Shell, Conoco-Phillips & Valero:
 ratio = (14.8/18.52 for refinery ext. combustion) x (2002 Em. Inventory)
 Subsequent calculations based on 2010 CAP Inventory, w/ 2005 Base Year
 2011 Shell, Conoco-Phillips & Valero
 ratio = (14.2/13.7 for refinery ext. combustion) x (2005 Em. Inventory)
 2012 Shell, Conoco-Phillips & Valero
 ratio = (14.7/13.7 for refinery ext. combustion) x (2005 Em. Inventory)

Attainment Plan Banking Allowances			NOx ERC Use by Year	
Year	ERC ton/day	IERC ton/day	ERCs Used (Toneyear)	Running Total (Toneyear)
2000	7.6	0	252.5	252.5
2001	7.6	7.4	278.7	531.2
2002	8.1	3.5	462.3	993.5
2003	8.1	3.5	252.7	1246.2
2004	8.1	5.3	118.0	1364.2
2005	8.1	7.2	322.0	1686.2
2006	8.1	7.2	123.0	1809.2
2007	8.1	7.2	245.9	2055.1
2008	8.1	7.2	207.2	2262.3
2009	8.1	7.2	5.0	2267.3
2010	8.1	4.3	37.9	2305.2
2011	7.2	4.9	57.4	2362.6
2012	7.2	4.9	0.3	2362.9

SURPLUS CALCULATIONS

Year 2000-02, 2004, 2006-11: IERCs generated exceed IERCs used. Therefore, IERCs generated are surplus.
Surplus Test: IERCs used exceeds IERCs generated (subject to change, based on future IERC banking applications)
 (Plan Emission Inventory + Banking Allowance in Emission Inventory) - (Actual Emissions + ERCs Used + IERCs Generated) >= 0
Year 2003: (1358.6 + 4234 tons) - (1942.4 + 1246.2 + 673.3 tons) >= 0 ? True. Therefore, IERCs are surplus.
Year 2005: (1329.3 + 5584.5 tons) - (1589.8 + 1686.2 + 672.5 tons) >= 0 ? True. Therefore, IERCs are surplus.
Year 2012: (1405.3 + 4416.5 tons) - (353.6 + 2362.9 + 253.3 tons) >= 0 ? True. Therefore, IERCs are surplus.

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