

PM 08/16/2013



ST. CHARLES REFINERY • Valero Refining - New Orleans, L.L.C. • P. O. Box 518 • Norco, Louisiana 70079-0518 • Telephone (985) 764-8611

RECEIVED

August 16, 2013

7011 3500 0001 6349 7915

AUG 22 2013

AI # 26003
T/150290
S13-31394
SERO
Von Magee
Air-ER

USPS Certified Mail:
LA Dept. of Environmental Quality
ATTN: Surveillance Division – SPOC
“Unauthorized Discharge Notification Report”
P. O. Box 4313
Baton Rouge, LA 70821-4313

DEQ
Single Point of Contact
LDEQ Southeast Regional Office
Building 4, Suite 420
201 Evans Road,
New Orleans, LA 70123-5230

State Emergency Response Commission
Office of the State Police
P. O. Box 66168.
Baton Rouge, LA 70896

Tiffany K. Clark, Council Secretary
St. Charles Parish Emergency Group
Email pdf: tclark@stcharlesgov.net
and cc: pduhe@st-charles.la.us
and cc: Jason.bonds@la.gov

Subject: Unauthorized Discharge Notification Report
AI No. 26003
Incident Date: August 9, 2013
LA Police Incident No. 13-03552 ; NRC No. 1056649, 1056659, 1056668, 1056730

Dear Sir/Madam:

- 1. Name, address, telephone number, Agency Interest (AI) number, and any other applicable identification numbers of the person, company, or other party who is filing the written report, and specific identification that the report is the written follow-up report required by LAC 33:I.3925:

Company Name: Valero St. Charles Refinery
Address: P. O. Box 518, Norco, LA 70079 (14902 River Road)
Telephone Number: 985-764-8611
AI No.: 26003

This is the first written follow-up report required by LAC 33:I.3925 for this incident.

- 2. Time and date of notification, the official contacted when reporting, the name of the person making that notification, and identification of the site or facility, vessel, transport vehicle, or storage area from which the unauthorized discharge occurred:

On August 9, 2013, at approximately 22:51 hrs, Mr. Charles Kock made the following notifications that the refinery experienced a power interruption resulting in excess H₂S and SO₂ emissions from multiple process units.

<u>Agency</u>	<u>Date/Time</u>	<u>Valero Rep</u>	<u>Action</u>	<u>Agency Rep</u>	<u>Purpose</u>
NRC	08/09/2013 22:51	Charles Kock	Call Made	N/A	No answer after 5 minutes
State Police	08/09/2013 22:56	Charles Kock	Call Made	N/A	No answer after 3 attempts
DEP	08/09/2013 23:01	Charles Kock	Call Made	Lee	Initial Incident Notification
NRC	08/09/2013 23:33	Charles Kock	Call Made	Brent	Initial Incident Notification
State Police	08/09/2013 23:42	Charles Kock	Call Made		Initial Incident Notification
EPA Region 6	08/09/2013 23:53	Charles Kock	Call Received	Enders	EPA request perimeter air monitoring
LDEQ	08/10/2013 00:10	Charles Kock	Call Received	Jason Bonds	LDEQ request perimeter air monitoring
LDEQ	08/10/2013 00:55	Charles Kock	Call Made	Jason Bonds	Report initial air monitoring results
EPA	08/10/2013 01:02	Charles Kock	Call Made	Enders	Report initial air monitoring results
NRC	08/10/2013 04:06	Charles Kock	Call Made	Brent	Emissions update SO ₂ and H ₂ S
State Police	08/10/2013 04:14	Charles Kock	Call Made	Hill	Emissions update SO ₂ and H ₂ S
DEP	08/10/2013 04:20	Charles Kock	Call Made	Lee	Emissions update SO ₂ and H ₂ S
EPA	08/10/2013 04:25	Charles Kock	Call Made	Enders	Emissions update SO ₂ and H ₂ S
LDEQ	08/10/2013 04:30	Charles Kock	Call Made	Jason Bonds	Emissions update SO ₂ and H ₂ S
DEP	08/10/2013 06:51	Charles Kock	Call Made	George	Additional air monitoring results
State Police	08/10/2013 06:53	Charles Kock	Call Made	Jennifer	Additional air monitoring results
NRC	08/10/2013 06:55	Charles Kock	Call Made	Huggins	Additional air monitoring results
LDEQ	08/10/2013	Charles Kock	Call Made	Jason Bonds	Additional air monitoring results
EPA	08/10/2013 06:59	Charles Kock	Call Made	Enders	Additional air monitoring results
NRC	08/10/2013 07:41	Charles Kock	Call Made	Huggins	>1000 NOx
State Police	08/10/2013 07:55	Charles Kock	Call Made		>1000 NOx
DEP	08/10/2013 07:56	Charles Kock	Call Made	George	>1000 NOx
LDEQ	08/10/2013 07:58	Charles Kock	Call Made	Jason Bonds	>1000 NOx
NRC	08/10/2013 15:30	Charles Kock	Call Made	Brent	Starting up process units; flaring ongoing from 1 flare
State Police	08/10/2013 15:39	Charles Kock	Call Made	Hill	Starting up process units; flaring ongoing from 1 flare

DEP	08/10/2013 15:37	Charles Kock	Call Made	Lee	Starting up process units; flaring ongoing from 1 flare
LDEQ	08/10/2013 15:41	Charles Kock	Call Made	Jason Bonds	Starting up process units; flaring ongoing from 1 flare
NRC	08/10/2013 21:38	Charles Kock	Call Made	Brent	>5000 lbs VOC and >100 lbs Propylene
State Police	08/10/2013 21:47	Charles Kock	Call Made	Hill	>5000 lbs VOC and >100 lbs Propylene
DEP	08/10/2013 21:48	Charles Kock	Call Made	Lee	>5000 lbs VOC and >100 lbs Propylene
LDEQ	08/10/2013 21:48	Charles Kock	Call Made	Jason Bonds	>5000 lbs VOC and >100 lbs Propylene
DEP	08/15/2013 15:13	Carolyn Baker	Call Made	Jared	Some unit still starting up
State Police	08/15/2013 15:16	Carolyn Baker	Call Made	Dennis	Some unit still starting up
NRC	08/15/2013 15:17	Carolyn Baker	Call Made	Dave	Some unit still starting up
DEP	08/16/2013 13:51	Carolyn Baker	Call Made	George	All Clear Notification
State Police	08/16/2013 13:53	Carolyn Baker	Call Made	Elizabeth	All Clear Notification
NRC	08/16/2013 13:54	Carolyn Baker	Call Made		Did not require all clear notification

3. Date(s), time(s), and duration of the unauthorized discharge and, if not corrected, the anticipated time it is expected to continue:

Date of Discharge: 08/09/2013
 Time of Discharge: Approximately 21:48
 Duration: Approximately 6.6 days

4. Details of the circumstances and events leading to any emergency condition, including incidents of loss of sources of radiation and if the release point is subject to a permit:

On August 9, 2013 at approximately 21:42 hrs, we experienced an interruption in power supply caused by a lightning arrestor electrical fault. The interruption caused the shutdown of multiple process units and resulted in excess emissions from the boilers, Sulfur Recovery Plants (SRPs), Fluid Catalytic Cracking Unit (FCCU), Gasoline Desulfurization Unit (GDU) and refinery flares.

a. The current permitted limit for the pollutant(s) released:

SO₂:
 50 pounds per hour (hourly maximum), Flare 1
 50 pounds per hour (hourly maximum), Flare 2
 25 pounds per hour (hourly maximum), Flare 3
 25 pounds per hour (hourly maximum), Flare 4
 50 pounds per hour (hourly maximum), Flare 5
 115.31 pounds per hour (hourly maximum), 3700 TOX
 115.31 pounds per hour (hourly maximum), 30 TOX

115.31 pounds per hour (hourly maximum), 1600 TOX
176.12 pounds per hour (hourly maximum), FCCU
5.13 pounds per hour (hourly maximum), GDU
10.77 pounds per hour (hourly maximum) Boiler 401-E
9.08 pounds per hour (hourly maximum) Boiler B-401C
9.08 pounds per hour (hourly maximum) Boiler B-401D

NOx:

31.00 pounds per hour (hourly maximum), Flare 1
31.00 pounds per hour (hourly maximum), Flare 2
12.95 pounds per hour (hourly maximum), Flare 3
12.95 pounds per hour (hourly maximum), Flare 4
25.90 pounds per hour (hourly maximum), Flare 5
9.40 pounds per hour (hourly maximum), 3700 TOX
9.40 pounds per hour (hourly maximum), 30 TOX
9.40 pounds per hour (hourly maximum), 1600 TOX
145.32 pounds per hour (hourly maximum), FCCU
8.00 pounds per hour (hourly maximum), GDU
16.80 pounds per hour (hourly maximum) Boiler 401-E
46.37 pounds per hour (hourly maximum) Boiler B-401C
36.82 pounds per hour (hourly maximum) Boiler B-401D

VOCs (includes propylene):

28.5 pounds per hour (hourly maximum), Flare 1
28.5 pounds per hour (hourly maximum), Flare 2
4.74 pounds per hour (hourly maximum), Flare 3
4.74 pounds per hour (hourly maximum), Flare 4
9.50 pounds per hour (hourly maximum), Flare 5
0.34 pounds per hour (hourly maximum), 3700 TOX
0.34 pounds per hour (hourly maximum), 30 TOX
0.34 pounds per hour (hourly maximum), 1600 TOX
15.50 pounds per hour (hourly maximum), FCCU
1.08 pounds per hour (hourly maximum), GDU
2.26 pounds per hour (hourly maximum) Boiler 401-E
1.91 pounds per hour (hourly maximum) Boiler B-401C
1.91 pounds per hour (hourly maximum) Boiler B-401D

CO:

168.30 pounds per hour (hourly maximum), Flare 1
168.30 pounds per hour (hourly maximum), Flare 2
28.05 pounds per hour (hourly maximum), Flare 3
28.05 pounds per hour (hourly maximum), Flare 4
56.10 pounds per hour (hourly maximum), Flare 5
8.11 pounds per hour (hourly maximum), 3700 TOX
8.11 pounds per hour (hourly maximum), 30 TOX
8.11 pounds per hour (hourly maximum), 1600 TOX

696.80 pounds per hour (hourly maximum), FCCU
16.47 pounds per hour (hourly maximum), GDU
34.59 pounds per hour (hourly maximum) Boiler 401-E
29.15 pounds per hour (hourly maximum) Boiler B-401C
29.15 pounds per hour (hourly maximum) Boiler B-401D

PM10:

1.00 pounds per hour (hourly maximum), Flare 1
1.00 pounds per hour (hourly maximum), Flare 2
0.17 pounds per hour (hourly maximum), Flare 3
0.17 pounds per hour (hourly maximum), Flare 4
0.33 pounds per hour (hourly maximum), Flare 5
1.40 pounds per hour (hourly maximum), 3700 TOX
1.40 pounds per hour (hourly maximum), 30 TOX
1.40 pounds per hour (hourly maximum), 1600 TOX
74.60 pounds per hour (hourly maximum), FCCU
1.49 pounds per hour (hourly maximum), GDU
3.13 pounds per hour (hourly maximum) Boiler 401-E
2.64 pounds per hour (hourly maximum) Boiler B-401C
2.64 pounds per hour (hourly maximum) Boiler B-401D

PM2.5:

1.00 pounds per hour (hourly maximum), Flare 1
1.00 pounds per hour (hourly maximum), Flare 2
0.17 pounds per hour (hourly maximum), Flare 3
0.17 pounds per hour (hourly maximum), Flare 4
0.33 pounds per hour (hourly maximum), Flare 5
1.40 pounds per hour (hourly maximum), 3700 TOX
1.40 pounds per hour (hourly maximum), 30 TOX
1.40 pounds per hour (hourly maximum), 1600 TOX
27.00 pounds per hour (hourly maximum), FCCU
1.49 pounds per hour (hourly maximum), GDU
3.13 pounds per hour (hourly maximum) Boiler 401-E
2.64 pounds per hour (hourly maximum) Boiler B-401C
2.64 pounds per hour (hourly maximum) Boiler B-401D

H₂S:

1.00 pounds per hour (hourly maximum), Flare 1
1.00 pounds per hour (hourly maximum), Flare 2
0.5 pounds per hour (hourly maximum), Flare 3
0.5 pounds per hour (hourly maximum), Flare 4
1.01 pounds per hour (hourly maximum), Flare 5
1.73 pounds per hour (hourly maximum), 3700 TOX
1.73 pounds per hour (hourly maximum), 30 TOX
1.73 pounds per hour (hourly maximum), 1600 TOX
0.90 pounds per hour (hourly maximum), FCCU

0.00 pounds per hour (hourly maximum), GDU
0.00 pounds per hour (hourly maximum) Boiler 401-E
0.00 pounds per hour (hourly maximum) Boiler B-401C
0.00 pounds per hour (hourly maximum) Boiler B-401D

b. The permitted release point/outfall ID:

Table 1. Source ID's and Associated Process Unit

Source I.D.	Descriptive Name
EQT013	Flare No. 1
EQT007	Flare No. 2
EQT034	Flare No. 3
EQT360	Flare No. 4
EQT240	Flare No. 5
EQT195	3700 TOX
EQT196	30 TOX
EQT241	1600 TOX
EQT016	FCCU
EQT094	GDU

c. Which limits were exceeded for air releases?

This incident is still under investigation and the estimated emissions will be submitted in a follow-up report.

5. Common or scientific chemical name of each specific pollutant that was released as the result of an unauthorized discharge, including the CAS number and U.S. Dept. of Transportation hazard classification, and best estimate of amounts of any or all released pollutants (expressed in pounds, including calculations):

Common or scientific chemical name = Sulfur Dioxide, SO₂
CAS No. 7446-09-5
U.S. DOT hazard class = UN1079

Common or scientific chemical name = Hydrogen Sulfide, H₂S
CAS No. 007783-06-4
U.S. DOT hazard class = UN1053

Common or scientific chemical name = Volatile Organic Compounds, VOC
CAS No. N/A
U.S. DOT hazard class = N/A

Common or scientific chemical name = NO_x
CAS No. N/A
U.S. DOT hazard class = N/A

Common or scientific chemical name = Propylene

CAS No. 115-07-1
U.S. DOT hazard class = UN1077

This incident is still under investigation and the estimated emissions will be submitted in a follow-up report.

6. Statement of actual or probable fate or disposition of the pollutant or source of radiation and what off-site impact resulted:

Process gasses from multiple process units were combusted in the flares. The resulting combustion byproducts were released to the atmosphere and dispersed.

Upsets in the sulfur recovery plants resulted in excess emissions from the thermal oxidizers (TOXs). The resulting excess emissions were released to the atmosphere and dispersed.

Upsets in the FCCU resulted in excess emissions from the flue gas scrubber. The resulting excess emissions were released to the atmosphere and dispersed.

Upsets in the GDU resulted in excess CO emissions from the heater. The resulting excess emissions were released to the atmosphere and dispersed.

Upsets in the refinery fuel gas system resulted in excess SO₂ emissions from the boilers. The resulting excess emissions were released to the atmosphere and dispersed.

7. Remedial actions taken, or to be taken, to stop unauthorized discharges or to recover pollutants or sources of radiation:

Emissions were minimized by removing crude feed and shutting down multiple process units.

8. Procedures or measures which have or will be adopted to prevent recurrence of the incident or similar incidents, including incidents of loss of sources of radiation:

This incident is still under investigation. No procedures or preventive measures have been identified at this time. This information will be submitted in a follow-up report.

9. If an unpermitted or unlicensed site or facility is involved in the unauthorized discharge, a schedule for submitting a permit or license application to the department, or rationale for not requiring a permit or license:

N/A

10. The reporting party's status (former or present owner, operator, disposer, etc.):

Valero Refining – New Orleans, L.L.C. is the present owner of the facility.

11. For discharges to the ground or groundwater, the following information shall also be included: all information of which the reporting party is aware that indicates pollutants are migrating, including, but not limited to, monitoring well data; possible routes of migrations; and all information of which the reporting party is aware regarding any public or private wells in the area of the migration used for drinking, stock watering, or irrigation:

N/A

12. What other agencies were notified:

The agencies listed in question number 2 were the only agencies notified.

13. Names of all other responsible parties of which the reporting party is aware:

N/A

14. A determination by the discharger of whether or not the discharge was preventable; if not, an explanation of why the discharge was not preventable.

This incident is still under investigation. We have not yet made a determination on whether or not this discharge was preventable. This information will be submitted in a follow-up report.

15. The extent of injuries, if any:

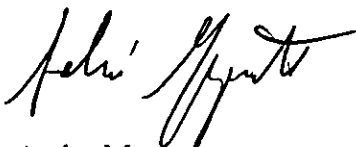
There were no injuries as a result of this incident.

16. The estimated quantity, identification, and disposition of recovered materials, if any:

No material was recovered from this event.

If you have any questions pertaining to this incident or require additional information please call Mr. Andre Marquette at 985-764-8611.

Sincerely,



Andre Marquette,
Environmental Engineering Manager

Enclosure



ST. CHARLES REFINERY • Valero Refining - New Orleans, L.L.C. • P. O. Box 518 • Norco, Louisiana 70079-0518 • Telephone (985) 764-8611

pm 10/8/13

October 8, 2013

AI# 26003
T/150290
SIB-31394
SERO

7011 3500 0001 6349 7328

USPS Certified Mail:

LA Dept. of Environmental Quality
ATTN: Surveillance Division – SPOC
“Unauthorized Discharge Notification Report”
P. O. Box 4313
Baton Rouge, LA 70821-4313

LDEQ Southeast Regional Office
Building 4, Suite 420
201 Evans Road,
New Orleans, LA 70123-5230

Von Magee
Air-ER

State Emergency Response Commission
Office of the State Police
P. O. Box 66168.
Baton Rouge, LA 70896

Ms. Tiffany K. Clark, Council Secretary
St. Charles Parish Emergency Group
Email pdf: tclark@stcharlesgov.net
And cc: pduhe@stcharlesgov.net

Subject: Unauthorized Discharge Notification Report
AI # 26003
Incident Date: 08/09/2013
LA Police Incident No. 13-03552
NRC No. 1056649, 1056659, 1056668, 1056730

Dear Sir/Madam:

- 1. Name, address, telephone number, Agency Interest (AI) number, and any other applicable identification numbers of the person, company, or other party who is filing the written report, and specific identification that the report is the written follow-up report required by LAC 33:I.3925:

Company Name: Valero St. Charles Refinery
Address: P. O. Box 518, Norco, LA 70079 (14902 River Road)
Telephone Number: 985-764-8611
AI No.: 26003

This is the 60 day follow-up report required by LAC 33:I.3925 for this incident.

- 2. Time and date of notification, the official contacted when reporting, the name of the person making that notification, and identification of the site or facility, vessel, transport vehicle, or storage area from which the unauthorized discharge occurred:

On August 9, 2013, at approximately 22:51 hrs, Mr. Charles Kock made the following notifications that the refinery experienced a power interruption resulting in excess H2S, NOx, and VOC emissions from multiple process units.

RECEIVED
OCT 12 2013
DEQ
Single Point of Contact

<u>Agency</u>	<u>Date/Time</u>	<u>Valero Rep</u>	<u>Action</u>	<u>Agency Rep</u>	<u>Purpose</u>
NRC	08/09/2013 22:51	Charles Kock	Call Made	N/A	No answer after 5 minutes
State Police	08/09/2013 22:56	Charles Kock	Call Made	N/A	No answer after 3 attempts
DEP	08/09/2013 23:01	Charles Kock	Call Made	Lee	Initial Incident Notification
NRC	08/09/2013 23:33	Charles Kock	Call Made	Brent	Initial Incident Notification
State Police	08/09/2013 23:42	Charles Kock	Call Made	Unknown	Initial Incident Notification
EPA Region 6	08/09/2013 23:53	Charles Kock	Call Received	Enders	EPA request perimeter air monitoring
LDEQ	08/10/2013 00:10	Charles Kock	Call Received	Jason Bonds	LDEQ request perimeter air monitoring
LDEQ	08/10/2013 00:55	Charles Kock	Call Made	Jason Bonds	Report initial air monitoring results
EPA	08/10/2013 01:02	Charles Kock	Call Made	Enders	Report initial air monitoring results
NRC	08/10/2013 04:06	Charles Kock	Call Made	Brent	Emissions update SO ₂ and H ₂ S
State Police	08/10/2013 04:14	Charles Kock	Call Made	Hill	Emissions update SO ₂ and H ₂ S
DEP	08/10/2013 04:20	Charles Kock	Call Made	Lee	Emissions update SO ₂ and H ₂ S
EPA	08/10/2013 04:25	Charles Kock	Call Made	Enders	Emissions update SO ₂ and H ₂ S
LDEQ	08/10/2013 04:30	Charles Kock	Call Made	Jason Bonds	Emissions update SO ₂ and H ₂ S
DEP	08/10/2013 06:51	Charles Kock	Call Made	George	Additional air monitoring results
State Police	08/10/2013 06:53	Charles Kock	Call Made	Jennifer	Additional air monitoring results
NRC	08/10/2013 06:55	Charles Kock	Call Made	Huggins	Additional air monitoring results
LDEQ	08/10/2013 06:57	Charles Kock	Call Made	Jason Bonds	Additional air monitoring results
EPA	08/10/2013 06:59	Charles Kock	Call Made	Enders	Additional air monitoring results
NRC	08/10/2013 07:41	Charles Kock	Call Made	Huggins	>1000 NO _x
State Police	08/10/2013 07:55	Charles Kock	Call Made	(Unknown)	>1000 NO _x
DEP	08/10/2013 07:56	Charles Kock	Call Made	George	>1000 NO _x
LDEQ	08/10/2013 07:58	Charles Kock	Call Made	Jason Bonds	>1000 NO _x
NRC	08/10/2013 15:30	Charles Kock	Call Made	Brent	Starting up process units; flaring ongoing from I flare
State Police	08/10/2013 15:39	Charles Kock	Call Made	Hill	Starting up process units; flaring ongoing from I flare
DEP	08/10/2013 15:37	Charles Kock	Call Made	Lee	Starting up process units; flaring ongoing from I flare
LDEQ	08/10/2013 15:41	Charles Kock	Call Made	Jason Bonds	Starting up process units; flaring ongoing from I flare
NRC	08/10/2013 21:38	Charles Kock	Call Made	Brent	>5000 lbs VOC and >100 lbs Propylene
State Police	08/10/2013 21:47	Charles Kock	Call Made	Hill	>5000 lbs VOC and >100 lbs Propylene
DEP	08/10/2013 21:48	Charles Kock	Call Made	Lee	>5000 lbs VOC and >100 lbs Propylene
LDEQ	08/10/2013 21:48	Charles Kock	Call Made	Jason Bonds	>5000 lbs VOC and >100 lbs Propylene
DEP	08/15/2013 15:13	Carolyn Baker	Call Made	Jared	Several units starting up
State Police	08/15/2013 15:16	Carolyn Baker	Call Made	Dennis	Several units starting up
NRC	08/15/2013 15:17	Carolyn Baker	Call Made	Dave	Several units starting up
DEP	08/16/2013 13:51	Carolyn Baker	Call Made	George	All Clear Notification
State Police	08/16/2013 13:53	Carolyn Baker	Call Made	Elizabeth	All Clear Notification
NRC	08/16/2013 13:54	Carolyn Baker	Call Made	(Unknown)	Did not require all clear notification

3. Date(s), time(s), and duration of the unauthorized discharge and, if not corrected, the anticipated time it is expected to continue:

Date of Discharge: 08/09/2013
 Time of Discharge: Approximately 21:48
 Duration: Approximately 6.6 days

4. Details of the circumstances and events leading to any emergency condition, including incidents of loss of sources of radiation and if the release point is subject to a permit:

On August 9, 2013 at approximately 21:42 hrs, we experienced an interruption in power supply caused by a surge arrestor electrical fault. The interruption caused the shutdown of multiple process units and resulted in excess emissions from the boilers, Sulfur Recovery Units (SRUs), Fluid Catalytic Cracking Unit (FCCU), Gasoline Desulfurization Unit (GDU), Coker Unit and refinery flares.

During the recovery process of the power loss event, shutdowns occurred to both the Hydrocracker unit (HCU) and Ultra-low sulfur diesel unit (ULSD) resulting in flaring. Both unit shutdowns were related to the shutdown of their recycle gas compressors. The HCU's recycle gas compressor malfunctioned due to low steam pressure which was directly related to the power loss event. The ULSD shutdown due to a malfunction of the recycle gas compressor's primary lube oil pump, and a delayed response for the startup of the secondary lube oil pump. We are unable to determine if the shutdown of the ULSD was directly related to the power loss event. However, the emissions contributed to the HCU and ULSD shutdowns are considered as part of the same power loss event and are included herein.

a. The current permitted limit for the pollutant(s) released:

See Attachment 1 for current permitted limits for the pollutants released. In addition, Specific Requirement number 897 (V12) is applicable to Flare No. 3, Flare No. 4, and Flare No. 5, which limits the amount of SO₂ released in a twenty four (24) hour period. Specific Requirement number 444 (V12) requires the coke drum not be opened to the atmosphere prior to reaching 5 psig.

b. The permitted release point/outfall ID:

Table 1. Source ID's and Associated Process Unit

Source I.D.	Descriptive Name
EQT013	Flare No. 1
EQT007	Flare No. 2
EQT034	Flare No. 3
EQT360	Flare No. 4
EQT240	Flare No. 5
EQT196	30 TOX
EQT241	1600 TOX
EQT195	3700 TOX
EQT016	FCCU
EQT094	GDU
EQT251	Coker No. 2 Steam Vent
EQT080	Boiler B-401C
EQT081	Boiler B-401D
EQT029	Boiler 401-E

c. Which limits were exceeded for air releases?

The Specific Requirement number 897 (V12) was exceeded 25 times by Flares No. 3 and Flares No. 4 and 72 times by Flare No. 5. The Specific Requirement number 444 (V12) was exceeded for one coke drum depressor cycle on August 10, 2013 at 12:07pm. In addition, the reportable quantities were exceeded for the following: H₂S, SO₂, NO_x, and VOC.

The estimated emissions, compared to applicable limits, are found in Attachment 1.

5. Common or scientific chemical name of each specific pollutant that was released as the result of an unauthorized discharge, including the CAS number and U.S. Dept. of Transportation hazard classification, and best estimate of amounts of any or all released pollutants (expressed in pounds, including calculations):

Common or scientific chemical name = Sulfur Dioxide, SO₂
CAS No. 7446-09-5
U.S. DOT hazard class = UN1079

Common or scientific chemical name = Hydrogen Sulfide, H₂S
CAS No. 007783-06-4
U.S. DOT hazard class = UN1053

Common or scientific chemical name = Volatile Organic Compounds, VOC
CAS No. N/A
U.S. DOT hazard class = N/A

Common or scientific chemical name = NO_x
CAS No. N/A
U.S. DOT hazard class = N/A

The estimated emissions associated with this incident are included as Attachment 2.

6. Statement of actual or probable fate or disposition of the pollutant or source of radiation and what off-site impact resulted:

Process gasses from multiple process units were combusted in the flares. The resulting combustion byproducts were released to the atmosphere and dispersed.

Emissions from the sulfur recovery plants were released from the thermal oxidizers (TOXs) to the atmosphere where they dispersed.

Emissions from the FCCU were released from the flue gas scrubber stack to the atmosphere where they dispersed.

Emissions from the GDU were released from the heater stack to the atmosphere where they dispersed.

Emissions from the boilers were released to the atmosphere where they dispersed.

Emissions from the coker vent were released to the atmosphere where they dispersed.

7. Remedial actions taken, or to be taken, to stop unauthorized discharges or to recover pollutants or sources of radiation:

The power loss caused the Crude Unit and Vacuum Unit to shut down immediately, thus preventing the manufacture of intermediates that feed subsequent process units. Downstream units were placed in circulation mode through manually closing valves, lowering reactor temperature and restarting tripped equipment such as compressors and pumps. Steam production was also increased as available to allow units to continue in circulation mode until power was restored. The HCU and ULSD units were re-started to reduce excess emissions. In addition, the flare gas recovery unit remained in operation during the entire incident to reduce the amount of flared gas.

8. Procedures or measures which have or will be adopted to prevent recurrence of the incident or similar incidents, including incidents of loss of sources of radiation:

The following corrective actions have been identified to prevent recurrence.

1. Perform thermal scans of the surge arrestors in the Prospect and Good Hope Substation yards.
2. Perform routine thermal scans of the surge arrestors in the Prospect and Good Hope Substation yards and to perform electrical tests per the ESARN standards at the prescribed intervals.
3. Complete the evaluation of all of the existing Valero owned surge arrestors in the Prospect and Good Hope Substation yards to determine if they are of the same age and model of the T3 arrestors that have shown signs of degradation. To date, the surge arrestors on T4 transformer have been identified as being of the same vintage and design as the failed arresters and will be the first targeted for replacement as will all arrestors of this design.
4. Evaluate one of the non-failed surge arrestors removed from service to determine if any degradation has started to occur.
5. Develop a plan to routinely replace of all surge arrestors in 230KV service at 10 year intervals.
6. Review this incident and emergency procedures with affected personnel.
7. Evaluate raising the autostart pressure setting on the auxiliary lube oil pump.
8. Evaluate increasing the trip time delay on the low-low lube oil shutdown.
9. Consider installing a valve on the make-up hydrogen at the ULSD unit battery limits to prevent fresh hydrogen from be introduced to the unit during a period of malfunction.
10. Add to existing Emergency Operation Procedure to account for Diamond Green Diesel, which is connected to the ULSD.
11. Contact corporate hydrocracking specialists to determine if the logic should be modified to initiate high rate depressurization upon loss of recycle gas compressor.

9. If an unpermitted or unlicensed site or facility is involved in the unauthorized discharge, a schedule for submitting a permit or license application to the department, or rationale for not requiring a permit or license:

N/A

10. The reporting party's status (former or present owner, operator, disposer, etc.):

Valero Refining – New Orleans, L.L.C. is the present owner of the facility.

11. For discharges to the ground or groundwater, the following information shall also be included: all information of which the reporting party is aware that indicates pollutants are migrating, including, but not limited to, monitoring well data; possible routes of migrations; and all information of which the reporting party is aware regarding any public or private wells in the area of the migration used for drinking, stock watering, or irrigation:

N/A

12. What other agencies were notified:

The agencies listed in question number 2 were the only agencies notified.

13. Names of all other responsible parties of which the reporting party is aware:

N/A

14. A determination by the discharger of whether or not the discharge was preventable; if not, an explanation of why the discharge was not preventable.

Several process units shutdown as a result of a sudden loss of power, which was not reasonably preventable. Evidence identified through a third party analysis of the failed arrester suggest that the energy handling capability of the surge arrester was less than nominal, possibly due to a design flaw. The design flaw is a likely cause since a secondary arrester, which passed electrical tests, showed similar degradation in the areas of the failed arrester. Prior to the arrester failure monthly thermal scans of the substation were conducted and nothing abnormal was indicated.

Shutdown of the ULSD unit due to the loss of the lube oil pump was also not considered reasonably preventable. Two lube oil pumps, one turbine and one electric, were in place to provide the recycle gas compressor with appropriate amounts of lube oil. Reasons for the loss of the primary turbine are unknown, but may be a result of changes in the steam supply following the power loss. A secondary electric turbine was in place, but did not start as expected to prevent the unit shutdown.

15. The extent of injuries, if any:

There were no injuries as a result of this incident.

16. The estimated quantity, identification, and disposition of recovered materials, if any:

No material was recovered from this event.

If you have any questions pertaining to this incident or require additional information please call Mr. André Marquette at 985-764-8611.

I certify based on information and belief formed after reasonable inquiry, the information in the attached document is true, accurate, and complete.

Sincerely,



Ralph Phillip
Vice President and General Manager

Enclosure

Attachment 1
Hourly Estimates Compared to Permit Limits

Flaring Emissions:

EQT 013 - Flare 1

Date	Start Time	End Time	Nox	CO	PM _{10/2.5}	SO ₂	H ₂ S	VOC
Permitted Max. lb/hr			31	168.3	1	50.00	1.28	28.5
8/9/2013	21:00	22:00	3	9	0	57	0	6
8/9/2013	22:00	23:00	44	2	2	2300	18	90
8/9/2013	23:00	0:00	67	0	2	3536	27	138
8/10/2013	0:00	1:00	73	0	3	3850	30	150
8/10/2013	1:00	2:00	67	0	2	3558	27	139
8/10/2013	2:00	3:00	74	0	3	3893	30	152
8/10/2013	3:00	4:00	81	0	3	4302	33	167
8/10/2013	4:00	5:00	52	0	2	2735	21	107
8/10/2013	5:00	6:00	62	0	2	3300	25	128
8/10/2013	6:00	7:00	68	0	2	3612	28	141
8/10/2013	7:00	8:00	67	0	2	3520	27	137
8/10/2013	8:00	9:00	66	0	2	3504	27	136
8/10/2013	9:00	10:00	16	0	1	858	7	34
8/10/2013	10:00	11:00	12	0	0	648	5	25
8/10/2013	11:00	12:00	17	0	1	870	7	34
8/10/2013	12:00	13:00	16	0	1	862	7	34
8/10/2013	13:00	14:00	22	0	1	1153	9	45
8/10/2013	14:00	15:00	17	0	1	919	7	36
8/10/2013	15:00	16:00	24	0	1	1241	10	48
8/10/2013	16:00	17:00	42	0	1	2214	17	86
8/10/2013	17:00	18:00	33	0	1	1717	13	67
8/10/2013	18:00	19:00	38	0	1	1989	15	78
8/10/2013	19:00	20:00	40	0	1	2129	16	83
8/10/2013	20:00	21:00	31	0	1	1640	13	64
8/10/2013	21:00	22:00	24	1	1	1251	10	49
8/11/2013	6:00	7:00	21	3	1	236	1	43
8/11/2013	7:00	8:00	28	1	1	323	2	58
8/11/2013	8:00	9:00	13	6	0	135	1	26
8/11/2013	20:00	21:00	2	8	0	2	0	3
8/11/2013	21:00	22:00	4	6	0	34	0	8

**Attachment 1
Hourly Estimates Compared to Permit Limits**

EQT 007 - Flare 2

Date	Start Time	End Time	Nox	CO	PM _{102.5}	SO ₂	H ₂ S	VOC
Permitted Max lb/hr			31	168.3	1	50	1	28.5
8/9/2013	21:00	22:00	59	159	2	1573	12	122
8/9/2013	22:00	23:00	28	78	1	732	6	58
8/10/2013	12:00	13:00	0	3	0	1	0	1

EQT 034 - Flare 3

Date	Start Time	End Time	Nox	CO	PM _{102.5}	SO ₂	H ₂ S	VOC
Permitted Max lb/hr			13	28.1	0.2	25	0.5	4.7
8/9/2013	22:00	23:00	0	1	0	0	0	0
8/10/2013	10:00	11:00	0	1	0	0	0	0
8/10/2013	11:00	12:00	0	0	0	0	0	0
8/10/2013	12:00	13:00	0	0	0	0	0	0
8/11/2013	6:00	7:00	0	1	0	0	0	0
8/12/2013	17:00	18:00	0	1	0	0	0	0
8/13/2013	13:00	14:00	0	2	0	0	0	1
8/13/2013	14:00	15:00	0	2	0	0	0	1

**Attachment 1
Hourly Estimates Compared to Permit Limits**

EQT 360 - Flare 4

Date	Start Time	End Time	Nox	CO	PM _{10/2.5}	SO ₂	H ₂ S	VOC
Permitted Max lb/hr			12.95	28.05	0.17	25	0.5	4.74
8/9/2013	23:00	0:00	30	10	1.05	0	0	0
8/10/2013	0:00	1:00	32	1	1.11	1	0	0
8/10/2013	1:00	2:00	38	1	1.34	1	0	0
8/10/2013	2:00	3:00	43	1	1.49	1	0	0
8/10/2013	3:00	4:00	46	1	1.61	1	0	0
8/10/2013	4:00	5:00	51	1	1.79	1	0	0
8/10/2013	5:00	6:00	51	1	1.79	1	0	0
8/10/2013	6:00	7:00	52	1	1.81	1	0	0
8/10/2013	7:00	8:00	53	1	1.86	1	0	0
8/10/2013	8:00	9:00	53	1	1.86	1	0	0
8/10/2013	9:00	10:00	54	1	1.89	1	0	0
8/10/2013	10:00	11:00	58	1	2.03	1	0	0
8/10/2013	11:00	12:00	44	1	1.53	1454	167	0
8/10/2013	12:00	13:00	4	0	0.15	144	17	0
8/10/2013	13:00	14:00	2	0	0.06	0	0	0
8/10/2013	16:00	17:00	2	0	0.09	0	0	0
8/10/2013	17:00	18:00	97	1	3.40	2	0	0
8/10/2013	18:00	19:00	134	1	4.68	3	0	0
8/10/2013	19:00	20:00	143	1	5.00	3	0	0
8/10/2013	20:00	21:00	149	1	5.22	3	0	0
8/10/2013	21:00	22:00	146	1	5.11	3	0	0
8/10/2013	22:00	23:00	145	1	5.08	3	0	0
8/10/2013	23:00	0:00	165	1	5.77	4	0	0
8/11/2013	0:00	1:00	169	53	5.91	4	0	0
8/11/2013	1:00	2:00	174	54	6.09	4	0	0
8/11/2013	2:00	3:00	175	54	6.12	4	0	0
8/11/2013	3:00	4:00	162	50	5.68	4	0	0
8/11/2013	4:00	5:00	151	47	5.28	3	0	0
8/11/2013	5:00	6:00	152	47	5.31	4	0	0
8/11/2013	6:00	7:00	151	47	5.29	3	0	0
8/11/2013	7:00	8:00	155	48	5.43	4	0	0
8/11/2013	8:00	9:00	163	50	5.68	4	0	0
8/11/2013	9:00	10:00	142	44	4.96	3	0	0
8/11/2013	10:00	11:00	148	46	5.16	3	0	0
8/11/2013	11:00	12:00	160	50	5.60	4	0	0
8/11/2013	12:00	13:00	150	47	5.23	3	0	0
8/11/2013	13:00	14:00	141	44	4.92	3	0	0
8/11/2013	14:00	15:00	141	44	4.92	3	0	0
8/11/2013	15:00	16:00	168	52	5.88	4	0	0

Attachment 1
Hourly Estimates Compared to Permit Limits

EQT 360 - Flare 4 Continued

Date	Start Time	End Time	Nox	CO	PM _{10/2.5}	SO ₂	H ₂ S	VOC
Permitted Max lb/hr			12.95	28.05	0.17	25	0.5	4.74
8/11/2013	16:00	17:00	134	42	4.67	3	0	0
8/11/2013	18:00	19:00	132	41	4.45	3	0	0
8/11/2013	19:00	20:00	134	42	4.62	3	0	0
8/11/2013	20:00	21:00	143	45	4.69	3	0	0
8/11/2013	21:00	22:00	136	43	4.99	3	0	0
8/11/2013	22:00	23:00	121	38	4.77	3	0	0
8/11/2013	23:00	0:00	99	31	4.24	2	0	0
8/12/2013	0:00	1:00	74	24	3.45	2	0	0
8/12/2013	1:00	2:00	54	17	2.60	1	0	0
8/12/2013	2:00	3:00	39	13	1.89	1	0	0
8/12/2013	3:00	4:00	29	10	1.37	1	0	0
8/12/2013	4:00	5:00	24	8	1.02	1	0	0
8/12/2013	5:00	6:00	25	9	0.84	1	0	0
8/12/2013	6:00	7:00	24	8	0.88	1	0	0
8/12/2013	7:00	8:00	24	8	0.83	1	0	0
8/12/2013	8:00	9:00	19	6	0.83	0	0	0
8/12/2013	9:00	10:00	15	5	0.65	0	0	0
8/12/2013	10:00	11:00	14	5	0.52	0	0	0
8/12/2013	11:00	12:00	7	3	0.50	0	0	0
8/12/2013	12:00	13:00	4	2	0.25	0	0	0
8/12/2013	13:00	14:00	8	3	0.14	0	0	0
8/12/2013	14:00	15:00	11	4	0.26	0	0	0
8/12/2013	15:00	16:00	12	5	0.37	0	0	0
8/12/2013	16:00	17:00	8	3	0.43	0	0	0
8/12/2013	17:00	18:00	2	1	0.28	0	0	0
8/12/2013	18:00	19:00	5	2	0.08	0	0	0
8/12/2013	19:00	20:00	0	0	0.17	0	0	0
8/13/2013	12:00	13:00	5	2	0.01	0	0	0
8/13/2013	13:00	14:00	8	3	0.16	0	0	0
8/13/2013	14:00	15:00	8	3	0.26	0	0	0
8/13/2013	17:00	18:00	8	3	0.27	0	0	0

Attachment 1
Hourly Estimates Compared to Permit Limits

EQT 240 - Flare 5

Date	Start Time	End Time	Nox	CO	PM _{102.5}	SO ₂	H ₂ S	VOC	1,3-Butadiene	Benzene	Ethyl Benzene	Hexane
	Permitted Max lb/hr		25.9	56.1	0.33	50	1	9.5	0.48	0.62	0.01	0.68
8/10/2013	0:00	1:00	57	101	0.65	161	1	49	0.02	1.22	0.00	20.19
8/10/2013	1:00	2:00	100	172	1.10	282	2	84	0.03	2.13	0.00	35.47
8/10/2013	2:00	3:00	81	140	0.90	230	1	68	0.03	1.74	0.00	28.86
8/10/2013	3:00	4:00	329	565	3.63	932	5	276	0.03	6.98	0.00	117.04
8/10/2013	4:00	5:00	29	53	0.34	82	0	26	0.00	0.62	0.00	10.25
8/10/2013	8:00	9:00	1	7	0.05	0	0	3	0.00	0.00	0.00	0.00
8/10/2013	9:00	10:00	2	7	0.04	4	0	3	0.00	0.03	0.00	0.55
8/11/2013	15:00	16:00	2	10	0.08	14	0	4	0.00	0.01	0.00	0.01
8/11/2013	16:00	17:00	1	5	0.06	49	0	2	0.02	0.02	0.00	0.02
8/11/2013	17:00	18:00	1	5	0.04	10	0	2	0.00	0.01	0.00	0.01
8/11/2013	19:00	20:00	1	5	0.06	43	0	2	0.02	0.02	0.00	0.03
8/11/2013	20:00	21:00	1	4	0.06	57	0	1	0.02	0.02	0.00	0.03
8/11/2013	21:00	22:00	1	4	0.14	184	1	2	0.03	0.04	0.00	0.04
8/11/2013	22:00	23:00	1	4	0.08	87	0	1	0.02	0.02	0.00	0.03
8/11/2013	23:00	0:00	1	3	0.11	147	1	1	0.05	0.06	0.00	0.07
8/12/2013	8:00	9:00	2	12	0.08	3	0	4	0.02	0.02	0.00	0.12
8/12/2013	12:00	13:00	3	16	0.10	0	0	4	0.03	0.03	0.00	0.26
8/12/2013	13:00	14:00	1	8	0.05	0	0	2	0.03	0.02	0.00	0.15
8/12/2013	14:00	15:00	93	505	3.29	0	0	31	1.30	0.12	0.00	21.91
8/12/2013	15:00	16:00	20	111	0.72	0	0	7	0.27	0.02	0.00	4.74
8/12/2013	16:00	17:00	1	4	0.03	0	0	2	0.00	0.00	0.00	0.00
8/12/2013	17:00	18:00	32	173	1.13	0	0	11	0.46	0.05	0.00	7.55
8/12/2013	19:00	20:00	2	12	0.08	0	0	2	0.06	0.05	0.00	0.34
8/13/2013	1:00	2:00	2	11	0.07	0	0	2	0.04	0.03	0.01	0.34
8/13/2013	2:00	3:00	2	11	0.07	0	0	2	0.05	0.05	0.01	0.33
8/13/2013	10:00	11:00	2	8	0.06	0	0	3	0.04	0.04	0.01	0.18

**Attachment 1
Hourly Estimates Compared to Permit Limits**

FCCU Emissions:

EQT 016 - FCCU

Date	Start Time	End Time	CO	SO2
Permitted Max. lb/hr			696.8	176.12
8/9/2013	21:00	22:00	793	363
8/9/2013	22:00	23:00	486	89
8/9/2013	23:00	0:00	378	3
8/10/2013	0:00	1:00	639	0
8/11/2013	1:00	2:00	742	0
8/12/2013	2:00	3:00	737	0
8/13/2013	3:00	4:00	733	0
8/14/2013	4:00	5:00	729	0
8/15/2013	5:00	6:00	721	0
8/16/2013	6:00	7:00	718	2
8/17/2013	7:00	8:00	717	3
8/18/2013	8:00	9:00	745	3
8/19/2013	9:00	10:00	809	3

GDU Emissions:

EQT 094 - GDU

Date	Start Time	End Time	CO
Permitted Max. lb/hr			16.47
8/10/2013	5:00	6:00	17
8/11/2013	6:00	7:00	17

**Attachment 1
Hourly Estimates Compared to Permit Limits**

SRU Emissions:

EQT 196 – 30 SRU

Date	Start Time	End Time	SO ₂
Permitted Max. lb/hr			115.3
8/11/2013	9:00	10:00	218
8/11/2013	10:00	11:00	120
8/11/2013	11:00	12:00	123
8/13/2013	9:00	10:00	126

EQT 241 – 1600 SRU

Date	Start Time	End Time	SO ₂	H ₂ S
Permitted Max. lb/hr			115.3	1.7
8/9/2013	23:00	0:00	120	1.8
8/10/2013	0:00	1:00	121	-
8/10/2013	2:00	3:00	290	-
8/10/2013	3:00	4:00	211	-
8/13/2013	15:00	16:00	208	-

Attachment 1
Hourly Estimates Compared to Permit Limits

Boiler Emissions:

EQT 080 – Boiler B401C

Date	Start Time	End Time	SO ₂
Permitted Max. lb/hr			9.08
8/11/2013	22:00	23:00	11.30

EQT 081 – Boiler B401D

Date	Start Time	End Time	SO ₂
Permitted Max. lb/hr			9.08
8/11/2013	22:00	23:00	11.07

EQT 029 – Boiler 401E

Date	Start Time	End Time	SO ₂
Permitted Max. lb/hr			10.77
8/11/2013	22:00	23:00	15.48

Attachment 2 Summary of Emissions

Emission Summary:

Descriptions	NOx	CO	PM _{10/2.5}	SO ₂	H ₂ S	VOC	1,3-Butadiene	Benzene	Ethyl Benzene	Phenol	Formaldehyde	Naphthalene	Hexane	Cresols	Aniline	Total PAH	Toluene	Xylene
Flare No. 1	1,235	658	43	56,384	433	2,544	1	2	0.04	-	0.2	-	2	-	-	-	1	1
Flare No. 2	157	619	6	2,306	18	324	0.11	0.14	0	-	0.02	-	0.16	-	-	-	0.11	0.09
Flare No. 3	20	107	1	1	-	41	0.02	0.03	-	-	0	-	0.03	-	-	-	0.02	0.02
Flare No. 4	5,552	1,275	194	1,724	184	26	8	11	0.24	-	1	-	12	-	-	-	8	7
Flare No. 5	850	2,406	16	2,287	12	763	3	13	0.05	-	0.09	-	249	-	-	-	0.62	0.53
30 TOX	-	-	-	1,481	1	-	-	-	-	-	-	-	-	-	-	-	-	-
1600 TOX	-	-	-	3,285	3	-	-	-	-	-	-	-	-	-	-	-	-	-
3700 TOX	-	-	-	3,384	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
FCCU	155	12,933	70	578	-	8.73	-	-	-	-	-	-	-	-	-	-	-	-
GDU	38	166	1	5	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-
Coker No. 2 Steam Vent	-	-	-	-	0.5	57	-	0.1	0.03	0.12	-	1.7	-	0.23	0.06	1.1	5.6	0.24
Boiler B-401C	28	5.9	1.7	11.3	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-
Boiler B-401D	22	1.3	1.6	11.1	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-
Boiler 401-E	8.2	-	2.3	15.5	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL (lbs)	8,065	18,171	336	71,472	652	3,764	12	26	0	0	1	2	263	0	0	1	15	9

Attachment 2
Summary of Emissions

Flare Formulas:

$$Q_{SO_2 \text{ released}} = \left(\frac{x \text{ scf}_{HC \text{ Gas}}}{hr} \right) \left(\frac{y \text{ scf}_{H_2S}}{\text{scf}_{HC \text{ Gas}}} \right) \left(\frac{lb - mol_{H_2S}}{379 \text{ scf}} \right) \left(\frac{0.99 \text{ lb} - mol_{SO_2}}{lb - mol_{H_2S}} \right) \left(\frac{64 \text{ lb}_{SO_2}}{lb - mol_{SO_2}} \right) = z \frac{lb_{SO_2}}{hr}$$

$$Q_{H_2S \text{ released}} = \left(\frac{x \text{ scf}_{HC \text{ Gas}}}{hr} \right) \left(\frac{y \text{ scf}_{H_2S}}{\text{scf}_{HC \text{ Gas}}} \right) \left(\frac{lb - mol_{H_2S}}{379 \text{ scf}} \right) \left(\frac{0.01 \text{ lb}_{H_2S, \text{ released}}}{lb_{H_2S}} \right) \left(\frac{34 \text{ lb}_{H_2S}}{lb - mol_{H_2S}} \right) = z \frac{lb_{H_2S}}{hr}$$

$$Q_{CO \text{ released}} = \left(\frac{x \text{ scf}_{HC \text{ Gas}}}{hr} \right) \left(\frac{y \text{ btu}}{\text{scf}_{HC \text{ Gas}}} \right) \left(\frac{0.37 \text{ lb}_{CO}}{\text{mmbtu}} \right) \left(\frac{\text{mmbtu}}{1e6 \text{ btu}} \right) = z \frac{lb_{CO}}{hr}$$

SRU and FCCU Formulas (For use with CEMS analyzers):

$$Q_{\text{pollutant released}} = (x \text{ ppmv}) \left(\frac{x \text{ scf}}{10^6 \text{ ppmv scf flue}} \right) \left(\frac{\text{scf}_{\text{flue}}}{hr} \right) \left(\frac{lb - mol}{379 \text{ scf}} \right) \left(\frac{MW_{lb}}{lb - mol} \right) = z \frac{lb_{\text{pollutant}}}{hr}$$