"DD28"

ATTACHMENT C

Chevron South Africa (Pty) Limited
Chevron Refinery
P.O. Box 13, Milnerton, 7435. Cape
Plattekloof Road, Milnerton, 7441. Cape
South Africa
Tel: +27 21 508-3911
Fax: +27 21 551-1975

Your Ref: 307/4

In reply please refer to:
A Borman/ivf2081

25 April 2012

Per email

HEALTH, ENVIRONMENT AND SAFETY

Mr Ossie Oswald
Regional Air Quality Practitioner
City Health
Air Quality Management
(021) 590 1419
(021) 590 1621
ossie.oswald@capetown.gov.za

cc. M Lushaba - mlushaba@deat.gov.za
cc. J Leaner - jleaner@pgwc.gov.za

Dear Sir

REGISTRATION CERTIFICATE 307/4
Annual Report 2011

With reference to Registration certificate 307/4 issued to the Chevron Refinery, Cape Town, we attach herewith our summary of air emissions for 2011.

Attachment 1 contains a summary of the air emission data submitted to CAPCO on a quarterly basis.

Attachment 2 contains the average monthly SO_2 in metric tonnes per day for 2011.

1. Sulphur Dioxide (SO_2)

- The annual average of total daily SO_2 emitted was 15.2 tonnes per day, well within the 22 tonnes per day limit.
- All ambient SO_2 results from the monitoring stations in the area surrounding the refinery were less than 24 hour SA ambient standard of 125 µg/m^3.

/2...

2. Particulate Matter

The annual average for particulate matter from the No. 1 Fluidised Catalytic Cracking Unit (FCCU) was 89 mg/m^3 and 74 mg/m^3 from the No. 2 FCCU.

3. Fugitive emissions

The following initiatives were implemented in 2011 to reduce fugitive emissions:

a) Leak Detection and Repair Program

In 2007, Chevron purchased an infrared imaging camera to detect fugitive emissions in the operating areas. The camera is capable of seeing VOC emissions that are invisible to the naked eye, and allows for a large number of sources to be scanned quickly and efficiently.

Two routine plant surveys plus an additional survey after the shut down were conducted on the Refinery during 2011.

Reduction of fugitive emissions is achieved by repairing the components that were found to be leaking during these surveys.

An annual report was sent to the department, and we have attached it to this report as **Attachment 3**.

b) Fence line monitoring program

Chevron's 'Annual Report for Passive VOC Monitoring at Chevron Cape Town Refinery' dated 17 April 2012 is shown in Attachment 4. This report covers the passive VOC monitoring carried out by SGS Environmental from June 2010 to June 2011 which is the sixth annual reporting period since the sampling program was instituted in June 2005.

Two new passive sampling positions were added to the program in June 2010 to monitor BTEX at the fence line in the vicinity of the Loading Bay. The Loading Bay passive monitoring is within the refinery fence and is therefore not an appropriate position for assessment against ambient standards. The annual average results for the new fence line monitoring positions from June 2010 to June 2011 are well within the current national ambient standard of 10 µg/m^3 and the 2015 national ambient standard of 5 µg/m^3. In line with the conclusions from the SGS report, the passive VOC monitoring program will continue at the new fence line position (Staff Parking) and discontinue sampling at the internal Loading Bay position.

A review of the data gathered since 2005 indicates that the passive fence line monitoring program has been successful in identifying potential areas of concern and tracking effectiveness of actions taken to address these. Toluene, ethyl benzene and xylene results have been well within the program guidelines throughout the monitoring program. Annual average benzene results are /3...

below the current national ambient standard (10µg/m³) at all fence line positions and below the monitoring program guideline and the 2015 national ambient standard (5µg/m³) at all fence line positions except the West fence. The West fence benzene results were only marginally above the 2015 standard and continue to show decreasing trend since 2008.

4. Low NOx burners

No additional low NOx burners were installed during 2011.

5. Opacity

Attachment 5 shows a summary of the availability of the opacity meters on the individual furnaces and boilers. Due to a shortage of critical spares for opacity meters, the opacity meters on furnaces 52-F201 and 56-F201 were unavailable for an extended period of time during February and July 2011. During this time opacity was monitored visually as far as possible. These furnaces fire gas only therefore opacity episodes are not common.

6. Summary of Air Related Incidents

There were no air related incidents in 2011.

7. Summary of Complaints

Attachment 6 contains a summary of complaints related to the Refinery in 2011.

8. Plans for 2012

The Refinery continues with the implementation of the projects as communicated in the environmental improvement plan submitted to the DEA. Updates on these projects will be discussed in the quarterly meetings.

Please contact me if you require any further details on this report.

Yours faithfully
CHEVRON SOUTH AFRICA (PTY) LIMITED

.....

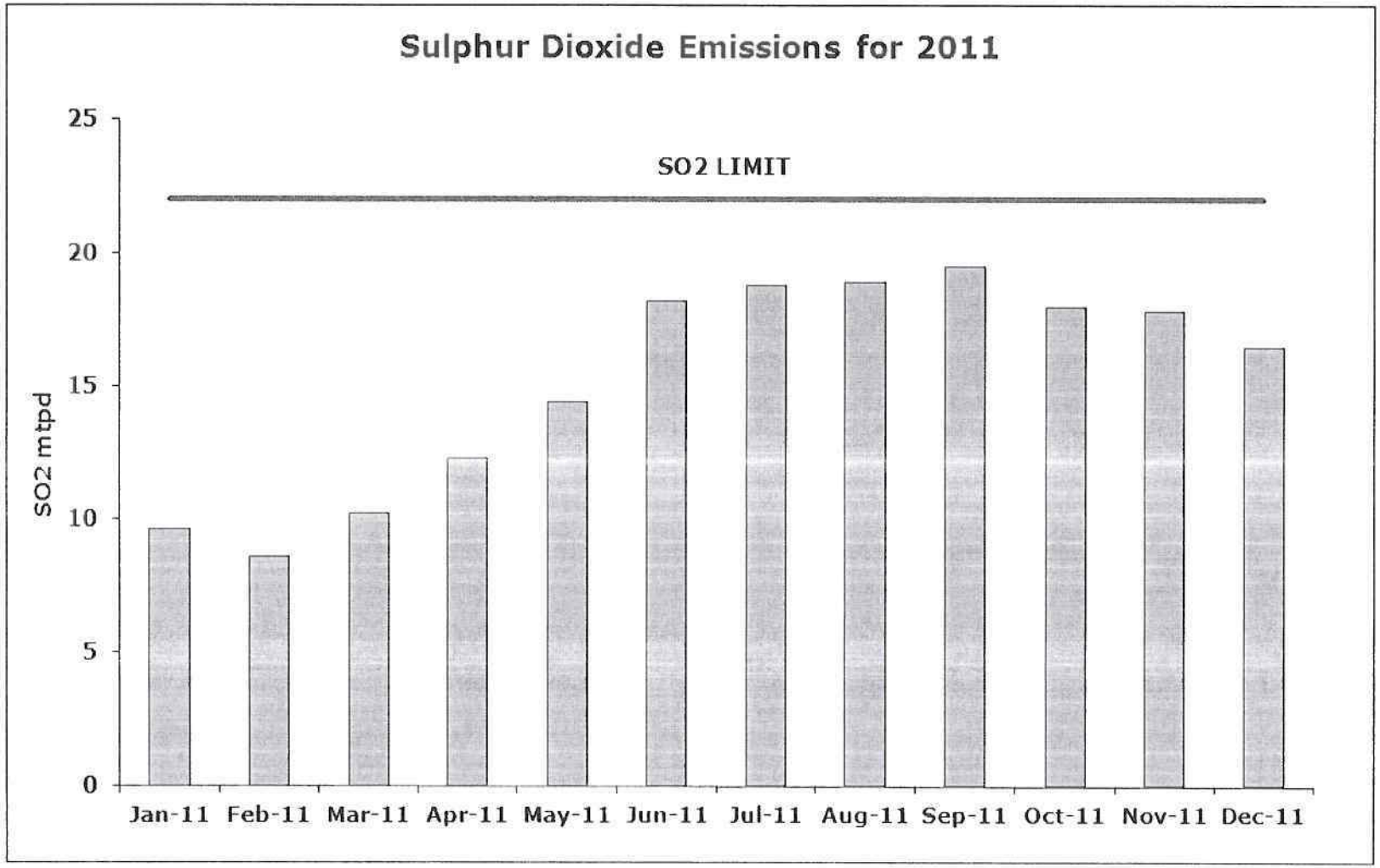
KGELE MATHIBA
Manager – Health, Environment and Safety

ATTACHMENT 1:

CAPCO REPORT- 2011

		Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Avg	Limit
Sulphur Dioxide Emitted															
SO2 & SO3 as Total SO2	MT/D	9.6	8.6	10.2	12.3	14.4	18.2	18.8	18.9	19.5	18.0	17.8	16.5	15.2	22 max
02F-201 Stack	MT/D	1.1	1.3	1.0	0.7	1.6	2.2	2.1	1.8	1.6	1.7	2.1	2.4	1.6	
2F-1 Combined	MT/D	0.7	2.0	2.8	1.4	1.4	1.2	1.0	0.9	0.7	0.9	0.6	1.0	1.2	
4F-1 Combined	MT/D	0.1	0.1	0.0	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
YIP Stack	MT/D	0.6	0.6	1.0	0.6	1.3	0.4	0.2	0.5	2.6	1.2	0.3	0.8	0.8	
No 1 FCCU Stack	MT/D	2.4	1.1	1.0	0.4	1.1	2.3	3.6	3.4	4.4	4.6	4.2	3.1	2.6	
56F-201 Stack	MT/D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Major Combined	MT/D	4.7	3.3	4.4	8.2	8.3	11.8	11.6	11.8	9.6	9.3	10.6	9.0	8.5	
71F-1	MT/D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Flare Stack	MT/D	0.02	0.10	0.05	0.60	0.27	0.26	0.30	0.43	0.56	0.27	0.2	0.1	0.26	
Sulphur in Burner Fuel															
wt% S in Refinery Burner Fuel	wt%	0.08	0.07	0.22	0.41	0.30	0.66	0.54	0.45	0.31	0.38	0.45	0.41	0.36	2 max
Ambient Sulphur Dioxide															
Max. 24hr average GLC	$\mu g/m^3$	20	20	20	38	26	31	62	58	46	41	31	53	37	265 max
Standards exceedences (125ug/m3 limit)		0	0	0	0	0	0	0	0	0	0	0	0		
Particulate Emissions from FCCUs															
No. 1 FCCU	mg/m3	98	85	52	79	139	76	114	79	93	71	84	97	89	100 max
No. 2 FCCU	mg/m3	74	26	70	59	44	72	89	64	95	59	64	171	74	100 max
SRUs Online % Efficiency															
No 1 SRU	%	99	99	98	99	98	99	99	99	96	98	100	100	99	95 min
No 2 SRU	%	99	98	98	98	97	99	99	99	99	100	100	99	99	95 min
SRUs % Availability															
SRU	%	100	100	100	100	100	100	100	100	100	100	100	100	100	99 min
				1Q 11			2Q 11			3Q 11			4Q 11		
VOC	MT/D			5.4			5.3			5.4			5.2		

ATTACHMENT 2:



ATTACHMENT 3:

Chevron South Africa (Pty) Limited
Chevron Refinery
P.O. Box 13, Milnerton, 7435. Cape
Plattekloof Road, Milnerton, 7441. Cape
South Africa
Tel: +27 21 508-3911
Fax: +27 21 551-1975

In reply please refer to:
M Fortuin/M2072

22 March 2012

Per email

HEALTH, ENVIRONMENT AND SAFETY

Mr Ossie Oswald
Regional Air Quality Practitioner
City Health
Air Quality Management
(021) 590 1621
Ossie.Oswald@capetown.gov.za

Dear Sir

Subject: Leak Detection and Repair Programme

Please find attached the annual report of the LDAR programme for 2011. The report should be self explanatory. However, please do not hesitate to enquire if you need any clarification. The report could also be further discussed at the next quarterly meeting.

Please forward the report to others in your organisation who have an interest.

Yours faithfully

CHEVRON SOUTH AFRICA (PTY) LIMITED

.....
JUDITH St LEGER
Lead - Environmental

c.c. Mr Ian Gildenhuys – City Health

Leak Detection and Repair Program
Cape Town Refinery
Annual Report – 2011

1. Background

The Chevron Cape Town Refinery submitted a Draft Leak Detection and Repair (LDAR) proposal (Leak Detection and Repair Program, Chevron South Africa (Pty) Limited, Cape Town Refinery) to the Department of Environmental Affairs and Tourism (DEAT) in January 2007.

In the proposal Chevron stated that it planned to use an infrared imaging camera to detect fugitive emissions in the process operating areas. The camera is capable of "seeing" Volatile organic compound (VOC) emissions that are invisible to the naked eye, and allows for a large number of sources to be scanned quickly and efficiently.

The FLIR GasFindIR camera has been in use at the refinery since September 2007 and the first full survey of the refinery process areas were conducted from October to December 2007.

Reductions of fugitive emissions are obtained by identifying and repairing components that are emitting fugitive emissions. The repaired components are rescanned with the IR camera to validate that the repairs have been successful.

Our draft plan stated that Chevron will conduct two surveys per annum and that an annual report be submitted with the following information:

a) Process Unit Identification
b) The number of pumps, compressors and valves for which leaks were detected
c) The number of pumps, compressors and valves for which leaks were not repaired
d) Facts that explain each delay of repair
e) Any revisions to previous reports

This report outlines the results of the two surveys carried out in 2011. The first survey was carried out in March and the second survey took place in December 2011. The report includes the status as at 28 February 2012 of equipment still to be repaired.

2. Equipment Monitoring and VOC Leak Repair

The refinery is split into four operating Zones and each zone consists of a number of process units. The surveys were performed by zone and by individual process unit from three different heights as proposed in our LDAR plan.

3. Results of leaking components during surveys (2011)

3.1 Leaks detected and repaired :

The table below displays the number of pumps, compressors and valves for which leaks were detected and repaired in 2011.

Component category	Total Estimated Number Installed	Number of leaks detected	Number of leaks repaired	Number of leaks not repaired
Pumps	339*	1	0	1
Compressors	6	2	0	2
Valves	16428*	10	3	7

** Estimated from Atmospheric impact report dated November 2006*

3.2 Explanation regarding leaks not repaired as at the date of submission.

- **Pumps**

The leak detected on the pump is still within the allowed time period for repairs.

- **Compressors**

The leaks detected on the compressors are still within the allowed time period for repairs.

- Valves

The following repairs have been assigned to the 'delay of repair' status as a shutdown of the associated equipment is required to allow the repair to take place:

1. 4K-2 Pressure regulator valve and PSV, repairs/replacement will be conducted during 2012 shutdown.
2. The valves on the compressor 3K-3 shall be shall be repaired when the compressor is brought down for its general maintenance in 2012.

Other outstanding repairs on valves are still within the timeframe of the LDAR compliance assistance plan.

4. Training

All new hires received fugitive emissions awareness training as part of the new employee induction program.

5. Conclusion

This report presents the results from both the full plant surveys conducted during 2011 in accordance with the Draft Leak Detection and Repair Program, Chevron South Africa (Pty) limited, Cape Town Refinery, submitted to DEAT, January 2007.

The first survey for 2012 will start at the beginning of April 2012. This survey will include the validation of repairs undertaken since the last survey, including those scheduled for the 2012 turnaround and inspection.

ATTACHMENTS 4 (INSERTED AT END OF DOCUMENT):

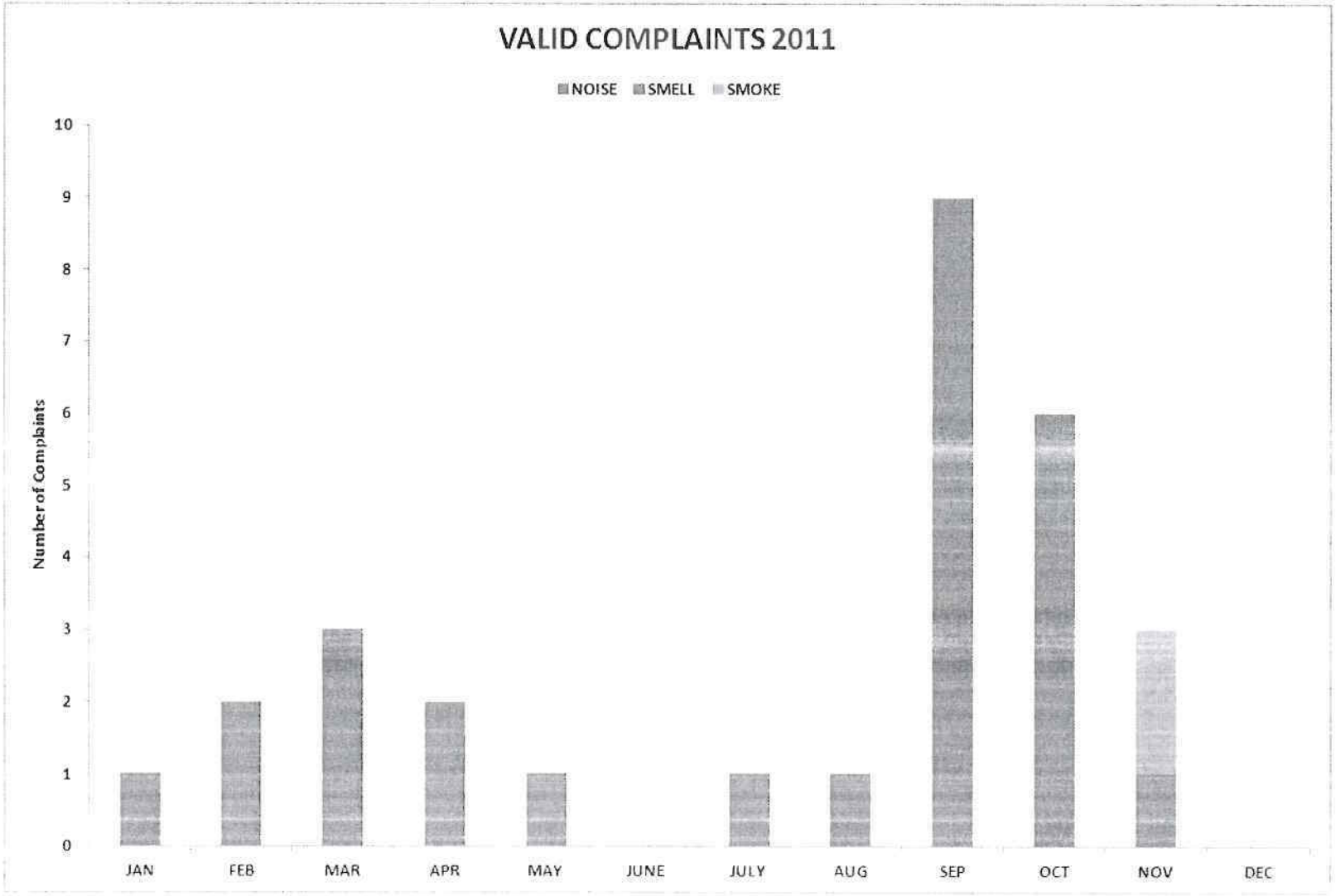
Annual Report for Passive VOC Monitoring at Chevron Cape Town Refinery: June 2010 to June 2011, including:

Appendix 1: SGS report number AQ175: "Passive sampling at Chevron South Africa for BTEX compounds Cape Town Refinery (June 2010 to June 2011)"

ATTACHMENT 5:

		Availbility of Opacity meters (%)												
		Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Average
02F-201	02AI004	100	100	100	100	100	100	100	100	100	100	100	100	100
2F-1	02AI001	100	100	100	100	100	100	100	100	100	100	100	100	100
3F-2 (3F1/3F2 & 6F1 Flue)	03AI002	100	100	100	100	100	100	100	100	100	100	100	100	100
4F-1/2/3/4 Combined Flue	04AI003	100	100	100	100	100	100	100	100	100	100	100	100	100
5F-1	05AI001	100	100	100	100	100	100	100	100	100	100	100	100	100
52F-201	52AI001	100	0	100	100	100	100	100	100	100	100	100	100	92
52F-202	52AI002	100	100	100	100	100	100	100	100	100	100	100	100	100
56F-201	56AI001	100	100	100	100	100	100	83	100	100	100	100	100	99
60F-1	60AI005	100	100	100	100	100	100	100	100	100	100	100	100	100
61F-1	61AI004	100	100	100	100	100	100	100	100	100	100	100	100	100
69F-1A	69AI004	100	100	100	100	100	100	100	100	100	100	100	100	100
69F-1B	69AI006	100	100	100	100	100	100	100	100	100	100	100	100	100
69F-1C	69AI007	100	100	100	100	100	100	100	100	100	100	100	100	100
69F-2	69AI601	100	100	100	100	100	100	100	100	100	100	100	100	100
71F-1	71AI008	100	100	100	100	100	100	100	100	100	100	100	100	100

ATTACHMENT 6:



ATTACHMENT 4

Chevron South Africa (Pty) Limited
Chevron Refinery
P.O. Box 13, Milnerton, 7435, Cape
Plattekloof Road, Milnerton, 7441, Cape
South Africa
Tel: +27 21 509 [illegible]
Fax: +27 21 551-1975

In reply please refer to:
J St Leger/ivf2079

17 April 2012

Mr Ossie Oswald
The City of Cape Town
Air Pollution Control
P O Box 16548
VLAEBERG
8018

Dear Sir

ANNUAL REPORT FOR PASSIVE VOC MONITORING AT CHEVRON CAPE TOWN REFINERY

Please find attached the annual report: "Passive sampling at Chevron South Africa for BTEX compounds Cape Town Refinery (June 2010 to June 2011)" prepared by SGS Environmental (Appendix 1). This letter includes a discussion on the trends and actions taken as well as the plan forward for the passive VOC monitoring program at the refinery.

Background

The June 2010 to June 2011 report covers the sixth annual reporting period since the sampling program was instituted in June 2005.

SGS Environmental (formerly Ecoserv) was appointed to carry out the monitoring and the first passive samplers were installed on 2 June 2005. The positions for the 7 sampling sites at the refinery were chosen in conjunction with representatives of the City of Cape Town (COCT) Air Pollution Section, COCT Scientific Services, Department of Environmental Affairs (DEA) and members of the Northern Communities Air Monitoring Task group. The details of the monitoring procedure and reporting methods were agreed and detailed in the Ecoserv Site Establishment report sent to you on 21 July 2005.

In the 2009 - 2010 monitoring period, it was recognised that one of the sampling sites, the Loading Bay, was internal to the refinery and did not accurately reflect fence line data. In order to better understand the concentrations closer to the fence line in the area, the City of Cape Town Air Pollution authorities relocated the mobile air quality monitoring station to the Chevron car park in a position in line with the loading bay. Additional passive monitoring positions were positioned at the inlet to the City's monitoring station and on the nearby fence for comparison purposes.

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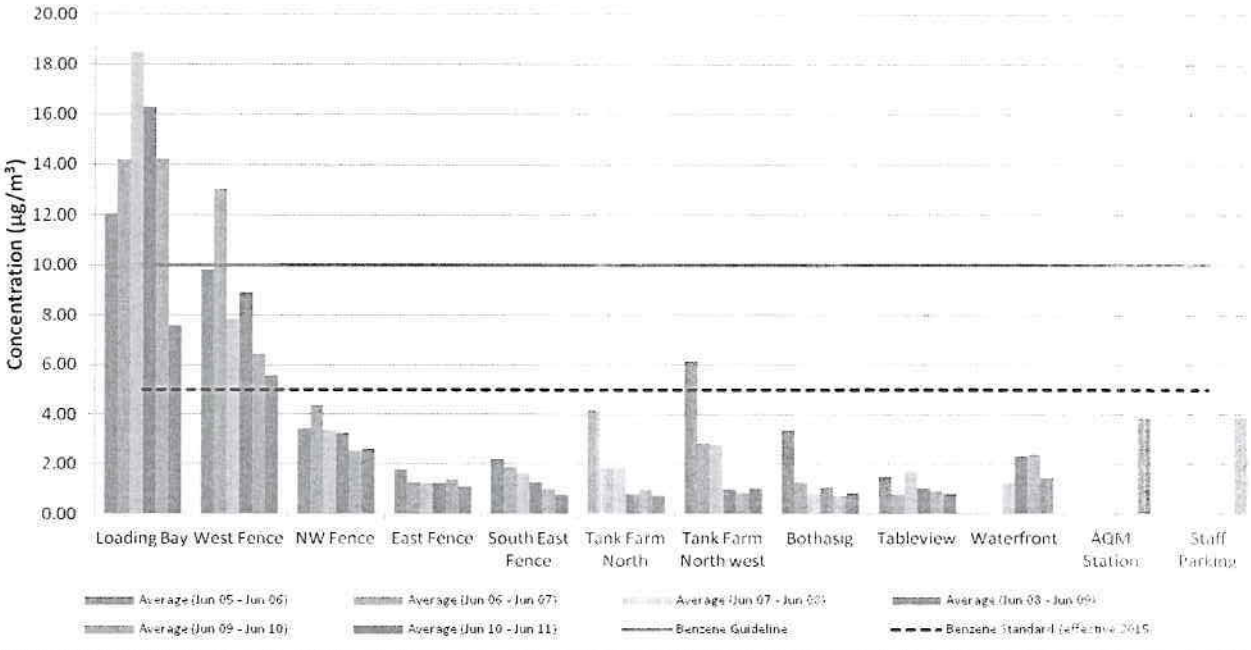
Monitoring reports have been made available to COCT and DEA throughout the year and the results have been presented and discussed at bi-monthly meetings of the Northern Communities Air Monitoring Task Group and quarterly meetings with DEA, DEADP, DWA and the City of Cape Town.

Overall trends

A review of the data gathered to date indicates that the passive fenceline monitoring program has been successful in identifying potential areas of concern and tracking effectiveness of actions taken to address these. Toluene, ethyl benzene and xylene results have been well within the programme guidelines throughout the monitoring programme. There has been a marked decrease in annual average benzene results at the loading bay and west fence. Annual average benzene results are below the current national ambient standard of 10 microgram/m^3 at all positions and below the monitoring program guideline and the 2015 national ambient standard of 5 microgram/m^3 at all the fenceline positions except the west fence. Annual average benzene results for the additional sampling sites at the AQM station and staff parking fall within the current and 2015 national ambient standards (see below an extract from the June 2010 to June 2011 report: Appendix 1 - Figure 5.1.1).

Fig 5.1.1: Annual Average Benzene Concentrations at the Monitoring Locations



Loading Bay/ AQM Station/ Staff Parking

Chevron has implemented a number of actions in the vicinity of the Loading Bay to identify the source and reduce VOC emissions in the area. These activities are discussed in detail in Chevron's report entitled 'Annual Report for Passive VOC Monitoring at Chevron Cape Town Refinery' dated 28 June 2011. As part of this process, Chevron engaged air quality authorities for their input. During these engagements, the authorities acknowledged that the ambient BTEX standards are not suitable for use within the refinery boundaries. Therefore, Chevron would continue to monitor at the actual refinery boundaries for a year and then re-assess the need for a program thereafter.

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Chevron added two passive sampling sites to the program in June 2011. The "Staff Parking" site is located close to the real refinery fence line on Plattekloof Rd in line with the Loading Bay position and close to the City's BTEX analyser in the staff car park. The "AQM station" sampling position is close to the inlet for the City's continuous BTEX analyser to allow for comparison of passive and continuous monitoring methods.

The reduction in benzene at the Loading Bay continued in the 2010/2011 period. Annual benzene results from the Staff Parking sampling site confirmed that the fence line results in the area are within the current and the 2015 national ambient standards. The results from the AQM station sampling site compared well with the results from the Staff Parking site and with the City's BTEX analyser results.

In line with the conclusion of the SGS report that the Staff Parking location is more representative than the internal Loading Bay position for assessment against ambient standards, the sampling positions at the Loading Bay and at the AQM station will be discontinued. The Staff Parking sampling site will be retained to monitor benzene at the fence line downwind of the Tanker Loading area.

West Fence

The annual average benzene results at the west fence have continued in a downward trend. The west fence results fall well within the national ambient standard of 10µg/m³, only marginally above the programme guideline and national ambient standard for 2015 of 5µg/m³. The decrease in 2010/2011 period may be attributed to the continued decrease in Loading Bay emissions and continued focus on minimising emissions from the Effluent Plant and other potential sources. This focus will be continued into 2012.

Future Plans for Monitoring and to address Emissions

1. Ongoing monitoring with revised scope:

   Due to the time lag in data, the decision to remove the Loading Bay and AQM station sites from the scope of the monitoring was taken in early 2012 and communicated to stakeholders at the Northern Communities Air Monitoring Task Group in March 2012. Therefore monitoring will continue at all 12 sites until mid 2012 to complete the current annual monitoring period. Thereafter, monitoring at the Loading Bay and the AQM Station will be discontinued. Monitoring will continue at the remaining 10 passive sampling sites.

2. Continue focus on potential sources that may affect the west fence during the 2011 to 2012 period.

The current contract with SGS Environmental has been extended to perform an additional annual survey from June 2011 to July 2012. These results will be shared with you as they become available.

Yours faithfully
Chevron South Africa (Pty) Limited

.....

K J MATHIBA
Manager – Health, Environment and Safety

c.c. Mazwi Lushaba - Dept of Environmental Affairs
Joy Leaner– Dept of Environmental Affairs & Development Planning

Att 1: SGS report number AQ175: "Passive sampling at Chevron South Africa for BTEX compounds Cape Town Refinery (June 2010 to June 2011)"

SGS

PASSIVE SAMPLING AT CHEVRON SOUTH AFRICA (PTY) LIMITED FOR BTEX COMPOUNDS

CAPE TOWN REFINERY

JUNE 2010 – JUNE 2011

1st Revision

Prepared for

Chevron South Africa (Pty) Ltd

AQ175

SGS

EXECUTIVE SUMMARY

SGS South Africa (Pty) Ltd was contracted by Chevron South Africa (Pty) Limited to perform monitoring of organic compounds at twelve (12) sites at and around their refinery in Cape Town. The monitors are located on the fence line of the refinery in line with the prevailing wind directions and opposite affected communities.

This report covers data collected over the past six (6) years and highlights the period July 2010 to June 2011.

After one year of co-located sampling at the loading bay site it has been determined that the outer fence-line is more representative for assessment against ambient standards and it is recommended that a single site at this location (the outer fence-line of parking area near loading bay) replace the existing Loading Bay sampler.

The national ambient air quality annual average standard for benzene (10µg/m^3) was not exceeded at any site during the period under review (June 2010 – June 2011). This represents a marked decrease over the past few years, particularly at the Loading Bay site where annual benzene levels decreased from 14.24µg/m^3 to 7.59µg/m^3 between the 2009 to 2010 and 2010 to 2011 review periods. The more stringent annual average standard for benzene of 5µg/m^3, as accepted by the NCamtg (Northern Communities air monitoring task group), was exceeded at both the Loading Bay and West Fence. This standard also represents the future national ambient air quality annual average standard which comes into effect 1st January 2015. However, since the Loading Bay is no longer the most representative site for measuring ambient levels of pollutants the original sampler on the inner fenceline should not therefore be used for ambient assessment (see above).

Toluene, ethyl-benzene and xylene levels were well below the accepted standards at all twelve sites for the period under review.

This annual report supersedes any interim data and reports issued throughout the year to allow for the consistent statistical treatment of averaging periods.

REPORT DETAILS

REFERENCE	AQ175/ 2010/11
REPORT TITLE	Passive Sampling for BTEX compounds at Chevron South Africa, Cape Town June 2010 – June 2011
DATE SUBMITTED:	25 March 2012
CLIENT:	Judy St Ledger Chevron South Africa (Pty) Limited Cape Town Refinery Koeberg Rd, Milnerton, 7435 Tel: +272150834 2 E-mail: jgstleger@chevron.com
PREPARED BY:	Helen Hill 1st Floor, Panther Park, 11 Berkley Road Maitland, Cape Town, 7405 Suite 259, Private Bag X18 Milnerton, 7435 Tel: +27 31 279 1490 E-mail: Helen.hill@sgs.com
SIGNED:	
APPROVER:	 Signed: Grant Ravenscroft
STATUS	Final Revision 1; revised to include a motivation for excluding sampling sites 7 and 11 from the ambient sampling campaign
NOTICE	This document is issued by SGS SA (Pty) Ltd under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects SGS's findings at the time of its intervention only and within the limits of Client's instructions, if any. SGS's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorised alteration, forgery or falsification of the content or appearance of this document is unlawful and of fenders may be prosecuted to the fullest extent of the law. This report has been independently verified. The approver's responsibility is limited to the assessment of the technical correctness of the report contents and associated calculations. On-site test work and site conditions, and associated findings and recommendations remain the responsibility of the author.

TABLE OF CONTENTS

ABBREVIATIONS

ALARP	As low as reasonably practicable
Ambient Noise	The annoying or otherwise intrusive noise under investigation
CO	Carbon monoxide
CO_2	Carbon dioxide
COP	Code of Practice
CSIR	Council of Scientific & Industrial Research
DEA	Department of Environment Affairs
DME	Department of Minerals and Energy
EPA	See US EPA
H_2O	Water
HRA	Health Risk Assessment
ISO	International Standards Organisation
ℓ/min	Litres per Minute
$m.sec^{-1}$	Metres per Second
m^3	Cubic Meters
Max	Maximum
mg/m^3	Milligrams per Cubic Meter
Min	Minimum
N_2	Nitrogen
NO_X	Nitrogen oxides
PM_{10}	Particulate matter of aerodynamic diameter less than 10mm
PPE	Personal Protective Equipment
ppm	Parts per million
SABS	South African Bureau of Standards
SO_2	Sulphur dioxide
US EPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
WHO	World Health Organisation

1 INTRODUCTION

1.1 Scope of Work

SGS South Africa (Pty) Ltd was contracted by Chevron South Africa (Pty) Limited to perform monitoring of organic compounds at its Cape Town Refinery according to the following scope over a 1 year period:

- Site establishment
- Manage the collection and deployment of 7 fenceline samples at the refinery and 3 samples at selected City of Cape Town monitoring sites
- Submit 20 samples monthly for analysis of BTEX compounds to SAL laboratories in the UK
- Submit 10 samples quarterly for more detailed VOC analysis
- Submit a monthly summary report

The report for the site establishment of the sampling network has been submitted to Chevron South Africa (Pty) Limited previously. The sites were selected by the project team who consisted of representatives of Chevron South Africa (Pty) Limited, the City of Cape Town, Department of Environmental Affairs and the Northern Communities Alliance. The project team visited the Cape Town Refinery and placed monitors strategically on the fence line of the refinery on the major wind directions and opposite affected communities. On 1 November 2007 the old Drill Hall site was replaced by the Waterfront CCT site for security reasons.

On 10th June 2010 an additional two sites were added to the sampling network. These sites are located on the City of Cape Town Air Quality Monitoring station caravan in the staff parking lot and on the outer fence of the staff parking lot at the refinery (see fig 3.2).

This report includes the results of the sampling at all 12 locations and covers the period from 28 June 2010 to 29 June 2011.

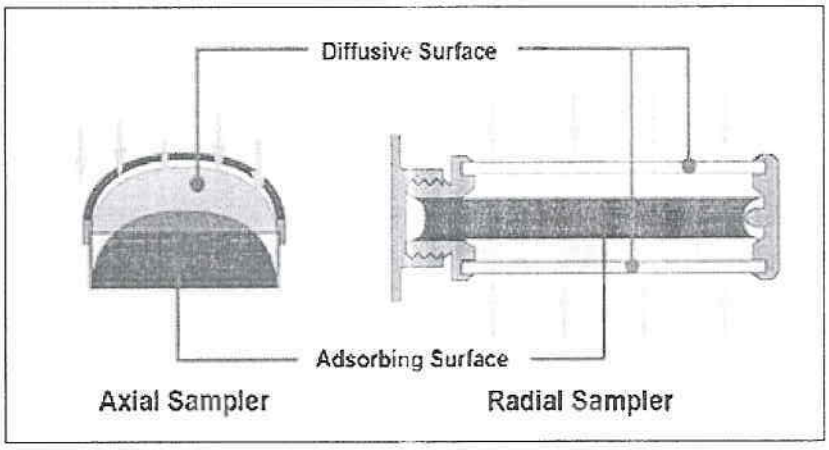
2 METHODOLOGY

2.1 Overview

An axial passive diffusive sampling network was set up where samples will be collected at 2 week intervals. This sampling methodology will follow European (CEN) standards (EN482 and EN13528). The basic principle of passive sampling is as follows:

Passive samplers are so-called because they do not involve the pumping of any air, instead gases adsorb onto filter material contained in a collection cartridge. The rate of absorption of the samplers is known and with the exposure time a gas concentration can be calculated. The figure below gives an indication of how the adsorption occurs:

Figure 2.1.1: Passive Sampling Schematic



Once the sample has been exposed for a period of typically 2 to 4 weeks it is removed and sent to a laboratory for analysis by gas chromatography with mass spectroscopy (GC-MS). This gives an indication of the mass of the target compound collected. For the purposes of this study the following compounds are being targeted. These are referred to as BTEX compounds:

- Benzene
- Toluene
- Ethyl Benzene
- Xylenes