25th May 2015

South Durban Community for Environmental Alliance (SDCEA)

Att: Bongani Mthembu

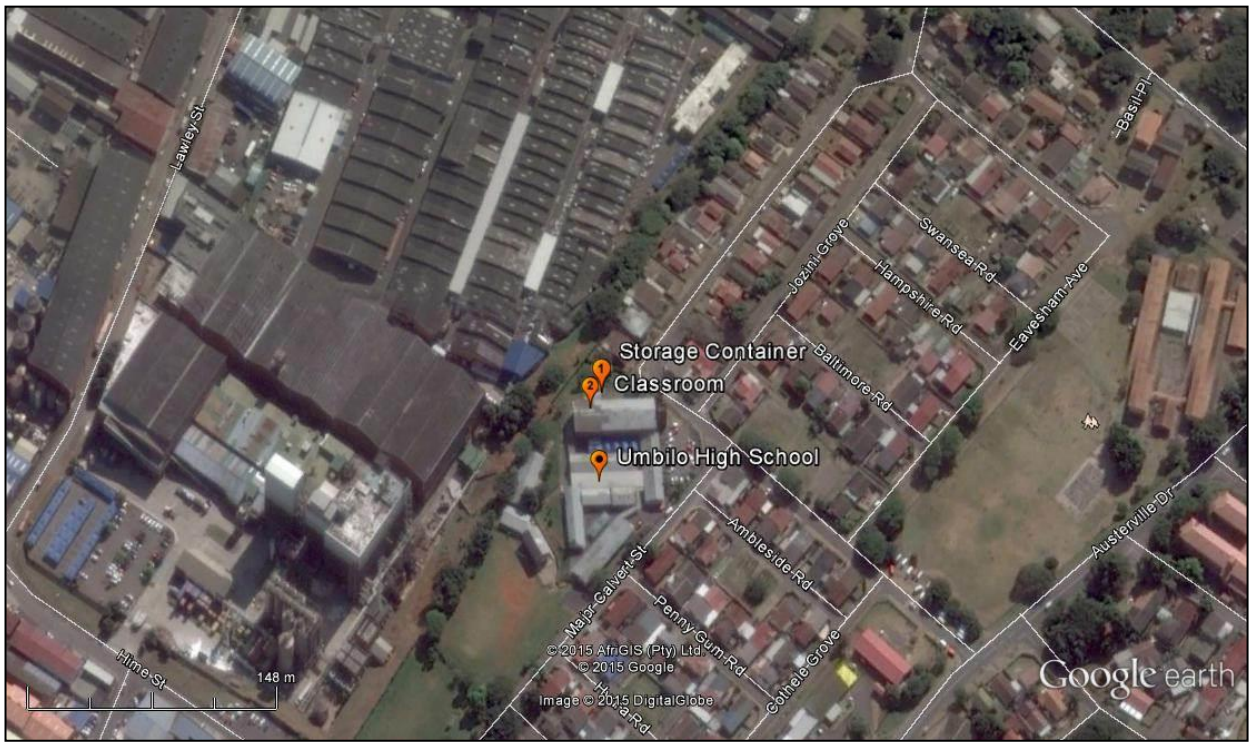
Ambient Air Quality Monitoring: Umbilo High School

1. Introduction:

Ambient Air Quality monitoring was undertaken at the Umbilo High School from the 5th of March till the 10th of April 2015. Air pollutants such as Sulphur Dioxide, Nitrogen Dioxide, Volatile Organic Compounds and Dust Fallout was monitored using passive Radiello samplers and ASTM 1739-98 (Reapproved 2004) Dust Fallout stands and buckets.

The Radiello samplers for SO_2, NO_2 and VOC's were deployed for a period of 8 days, whilst the DFO Unit was deployed for a period of 30 days.

The figure below indicates the locality of the school in relation to its surrounding land use;



2. Results:

TABLE 1: RADIELLO SAMPLER'S RESULTS

Compound	Measured Concentration - $\mu g/m^3$		Ambient Air Quality Standard - $\mu g/m^3$	Evaluation
	Sample 1	Sample 2		
Sulphur Dioxide – SO_2	<0.02	0.13	125 $\mu g/m^3$ 24hr	Compliant Results
Nitrogen Dioxide – NO_2	0.66	0.71	40 $\mu g/m^3$ 1 Year	
Volatile Organic Compounds:				
Benzene	0.22	0.10	5 $\mu g/m^3$ 1 Year	Compliant Result
1-Pentene	0.16	0.17	N / A	No set National Ambient Air Quality Standards.
n-Hexane	0.04	0.09		
MEK	0.10	0.38		
Ethyl acetate	0.05	0.14		
2-Methylhexane	0.24	0.19		
3-Methylhexane	0.32	0.26		
n-Heptane	0.79	0.67		
Toluene	2.20	2.67		
n-Octane	0.59	1.07		
Ethyl benzene	2.04	5.25		
Xylene	10.75	42.96		
n-Nonane	1.59	21.48		
Propyl benzene	0.35	4.48		
1,2,3-Trimethylbenzene	0.60	8.67		
n-Decane	3.56	57.97		
1,2,4-Trimethylbenzene	2.90	44.70		
d-limonene	0.93	7.57		
1,3,5-Trimethylbenzene	0.88	22.27		
Total VOC	**28.31**	**221.09**	-	

TABLE 2: DUST FALLOUT RESULTS

Sample	Location	GPS Coordinates	Residential Area ($mg/m^2/Day$)	Measured Concentration ($mg/m^2/Day$)
7929 - 1	Umbilo High School – Storage Container	26˚ 46' 21.30" S 31˚ 56' 25.62" E	D < 600	54

STANDARD LIMITS APPLIED

TABLE 3: NATIONAL DUST CONTROL REGULATIONS LIMITS

1	2	3	4
Level	**Dustfall rate, D ($mg \cdot m^{-2} \cdot day^{-1}$, 30-d average)**	**Averaging period**	**Permitted frequency of exceeding dustfall rate**
Residential Area	D < 600	30 days	Two within any year, no two sequential months.
Non-residential Area	600 < D < 1200	30 days	Two within any year, not sequential months.

Source: National Dust Control Regulations, Government Gazette 36974 dated 1 November 2013

3. Evaluations

Radiello diffusive samplers for Sulphur Dioxide (SO_2) and Nitrogen Dioxide (NO_2) and Volatile Organic Compounds (VOCs) were deployed at the Storage Container outside as well as inside a class room on the First floor.

Radiello diffusive samplers deployed for Sulphur Dioxide (SO_2) and Nitrogen Dioxide (NO_2) returned **compliant** results when compared to the National Ambient Air Quality Standards. A comparison of the results indicated that higher contaminant concentrations were observed from the sample inside the class room as opposed to the one outside at the Storage Container.

The Radiello diffusive sampler deployed for Volatile Organic Compounds (VOCs) returned a result below the National Ambient Air Quality Standard for Benzene, i.e. **compliant.** For all other VOCs, no set National Ambient Air Quality Standards are available to which the results can be compared.

As with the SO_2 and NO_2 samples, the VOC sample inside the class room returned results far greater for the majority of contaminants, specifically BTEX (Benzene, Toluene, Ethyl-benzene and Xylene) compound vapours when compared to the outside sample. The containment of air and poor ventilation measures of the class room creates a build-up of vapours within.

It should however be noted that Benzene concentrations obtained were significantly lower when compared to the results obtained during the sampling period of September to October 2014.

The National Dust Control Regulations, Government Gazette 36974 dated 1 November 2013, sets the DFO Limits for Residential Areas as D < 600 mg/m^2/day and Non-residential Areas as 600 < D < 1200 mg/m^2/day. The Dust Fallout unit deployed at the outside Storage Container, returned **compliant** results when compared to both the Residential and Non-residential limits.

4. Limitations

The results obtained were indicative of the conditions that prevailed during the sampling period. Changes in season, meteorology, production rate, process and other factors which affect contaminant generation and transmission, would cause variations in sample results. The archived DFO filters could be subjected to further analytical methods, on instruction from SDCEA or recommendation by Apex Environmental.

5. Certification Statement

This is to certify that the attached report has been compiled and issued under the authority, direction and the responsibility of an Apex Environmental, Occupational Hygienist.

Yours Sincerely,

Leon Pretorius
Environmental Manager
BSocSc Hons: Environmental Management (UKZN)
Registered Occupational Hygiene Technologist (SAIOH)

This letter serves to confirm the following company details as requested:

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