

RICHARDS BAY CLEAN AIR ASSOCIATION

DUSTFALL MONITORING

MAY 2008

Sampling period: 17 April to 19 May 2008

Monthly Progress Report

Contact Person: Q. Hurt
Designation: Managing Director

M. Antoni
Consultant

Project Leader: H.J. Annegarn

Project Officers: L. Khumalo
Z. Mpina
J. Smith
H. Nuwarinda

AER

Annegarn Environmental Research
Member of the SGS Group

P.O. BOX 30981
BRAAMFONTEIN
2017

05 June 2008

AER 28.310M_RBCAA

1. METHODOLOGY

This project commenced operation in June 2006. Windblown settle-able dust (fall-out) is monitored using the American Society for Testing and Materials standard method for collection and analysis of dustfall (ASTM D1739). This method employs a simple device consisting of a cylindrical 5 L container half-filled with de-ionised water exposed for one calendar month (30 ± 3 days). The water is treated with an inorganic biocide to prevent algal growth in the buckets. The most common reagent used for this is a 5% copper sulphate solution (approximately 1 ml per 3 litres of water bucket).



Figure 1: Single bucket monitoring unit, showing sampling bucket with bird ring and security clamp

The bucket stand comprises a ring that is raised above the rim of the bucket to prevent contamination from perching birds (Fig 1). The bucket holder is connected to a 2.1 m galvanized steel pole, which is either directly attached to a fence post or can be attached to a galvanized steel base plate, which is buried to a depth of 500 mm. This allows for a variety of placement options for the fallout samplers. Exposed buckets, when returned to the AER laboratories, are rinsed with deionised water to remove residue from the sides of the bucket, and the bucket contents filtered through a coarse (>1 mm) filter to remove insects and other coarse organic detritus. The sample is then filtered through a pre-weighed paper filter to remove the insoluble fraction, or dust fallout. This residue and filter are dried, and gravimetrically analysed to determine the insoluble fraction (dust fallout).

1.1 Operational Aspects

The sampling period was from 17 April to 19 May 2008 and samples were exposed for 32 days. The period complies with the standard exposure period of 30 ± 3 days. Site 1 (Brackenhams) recorded no data as the bucket was damaged. No other operational problems were encountered during the May monitoring month and a valid sample return of 92% was achieved. It was reported in the reporting month of

April 2008 that there is manufacturing of Ferro metals opposite Site 2 (SAPS Garage – Alton North), action blasting near Site 3 (Alton South West) and construction near Site 12 (Meerensee School) which is still going on.

2. STANDARDS FOR DUST DEPOSITION

The Standards South Africa has published a new set of dustfall standards (SANS 1929:2005). These standards have been used to evaluate the level of dust deposition and are stated in Table 1 and Table 2 below.

2.1 Evaluation criteria for dust deposition

Dust deposition rates shall be expressed in units of $\text{mg}/\text{m}^2/\text{day}$ over a 30-days averaging period. Dust deposition is evaluated against a four-band scale as presented in Table 1. Target, action and alert thresholds indicated in and permissible frequency of exceedances are given in Table 2. Margins of tolerance are outline in Section 2.2 and allowances for exceptions in Section 2.3

Table 1: Four-band scale evaluation criteria for dust deposition (SANS 1929:2005).

Band Number	Band Description Label	Dustfall rate (D) ($\text{mg}/\text{m}^2/\text{day}$, 30-day average)	Comment
1	Residential	$D < 600$	Permissible for residential and light commercial
2	Industrial	$600 < D < 1\ 200$	Permissible for heavy commercial and industrial
3	Action	$1\ 200 < D < 2\ 400$	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year.
4	Alert	$2\ 400 < D$	Immediate action and remediation required following the first incidence of dustfall rate being exceeded. Incident report to be submitted to relevant authority.

Table 2. Dustfall standards, target, action and alert thresholds for dust deposition (SANS 1929:2005).

Level	Dustfall Rate ($\text{mg}/\text{m}^2/\text{day}$)	Permitted Frequency of Exceedances
Target	300	
Action residential	600	Three within any year, no two sequential months.
Action industrial	1 200	Three within any year not sequential months.
Alert threshold	2 400	None. First exceedance requires remediation and compulsory report to authorities.

2.2 Margin of tolerance

An enterprise may submit a request to the authorities to operate within band 3 (action band), as specified in Table 1, for a limited period, provided that this is essential in terms of the practical operation of the enterprise (for example the final removal of a tailings deposit) and provided that an appropriate control technology is applied for the duration. No margin of tolerance will be granted for operations that result in dustfall rates which fall within band 4 (alert band) as specified in Table 1.

2.3 Exceptions

Dustfalls that exceed the specified rates but that can be shown to be the result of some extreme weather or geological event shall be discounted for the purpose of enforcement and control. Such event might typically result in excessive dustfall rates across an entire metropolitan region, and not be localized to a particular operation. Natural seasonal variations, for example, the naturally windy months each year, will not be considered extreme events for this definition.

2.4 to1 Tc 0.237g010.0005rol u-0.004 -1.3083 0 Td379 TwSec90 of ed RB04.3a46 0 Td[e 4(o1

4. Recommendations and Actions

- RESIDENTIAL threshold levels were recorded at all the monitoring sites. The results were considered satisfactory as they will not result in community complaints or nuisance.

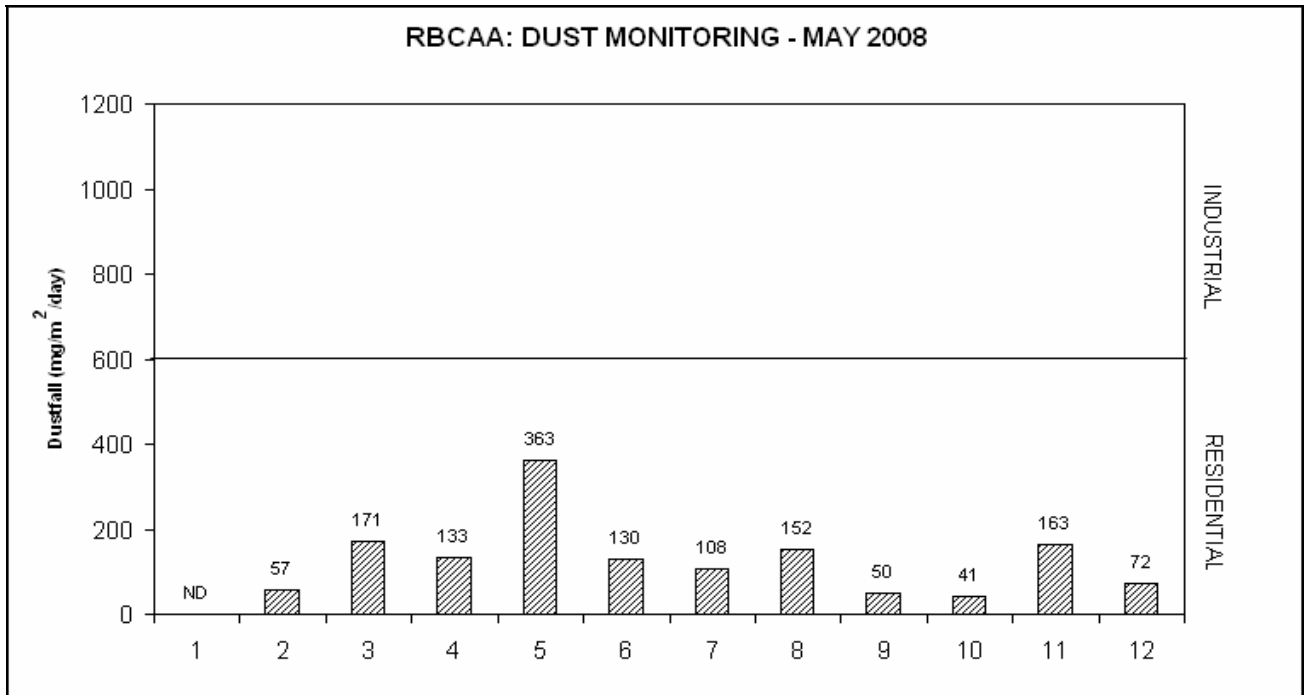
Regards

T. Mfenqa

For AER (Pty) Ltd

Report compiled by H. Nuwarinda

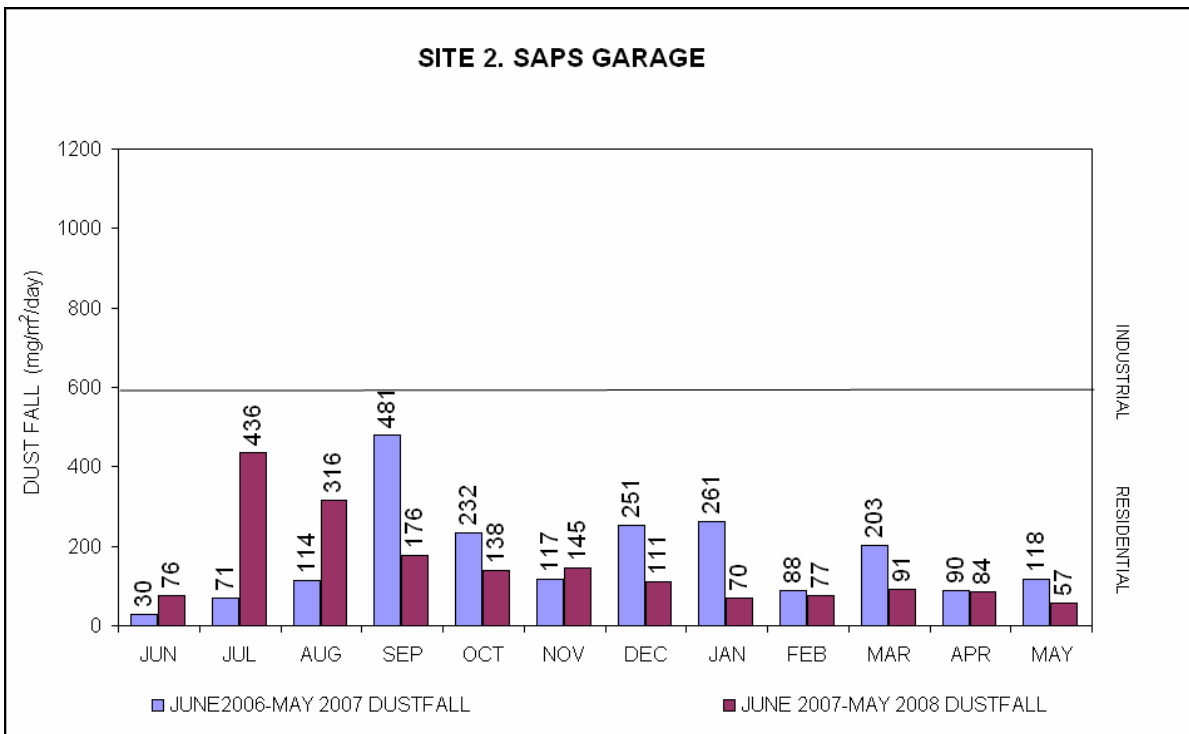
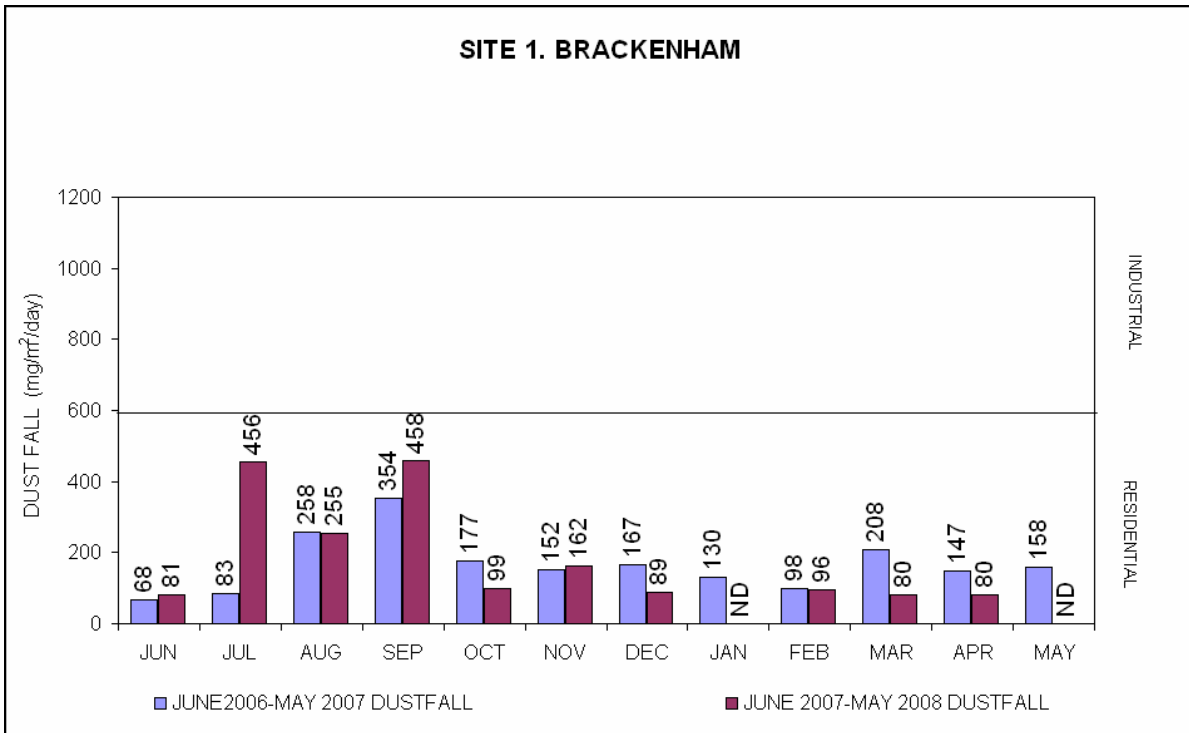
Figure 1: Graph showing results from all sites: May 2008

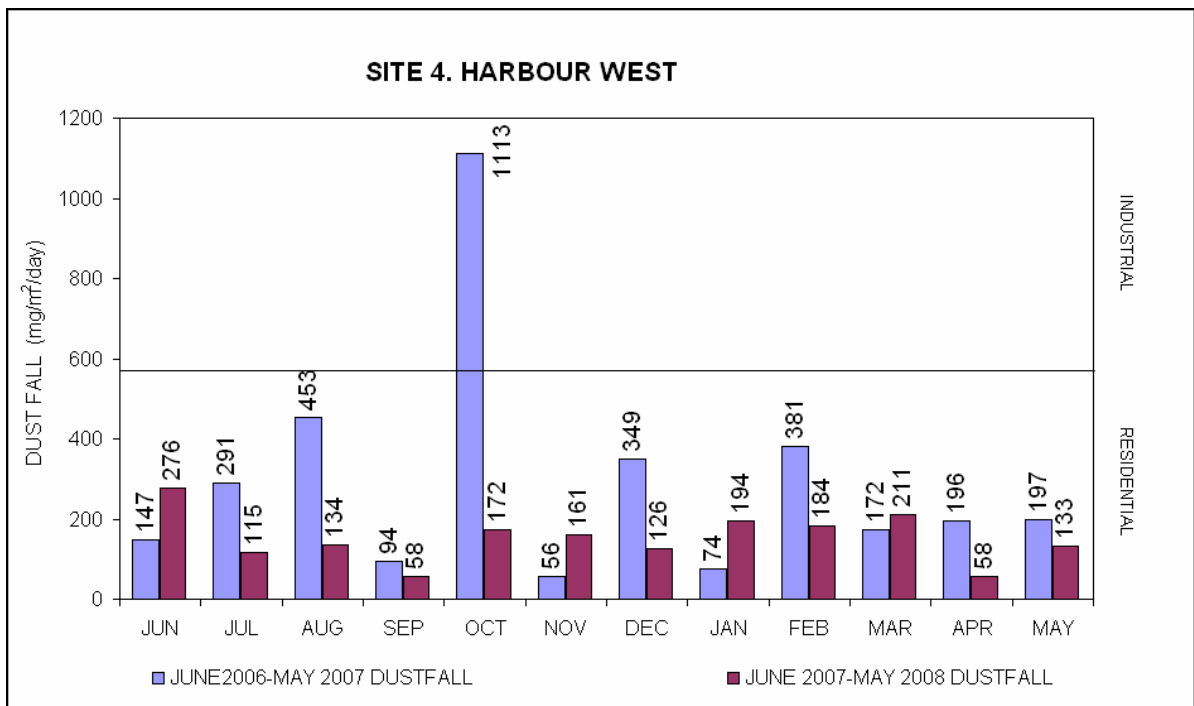
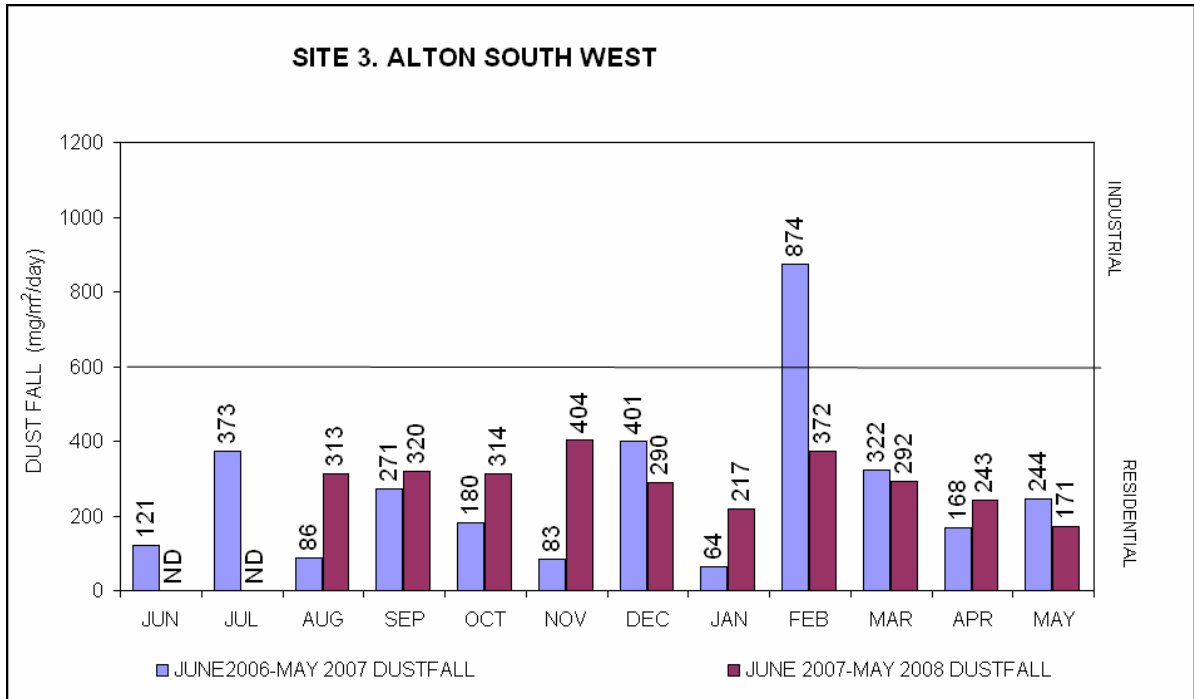


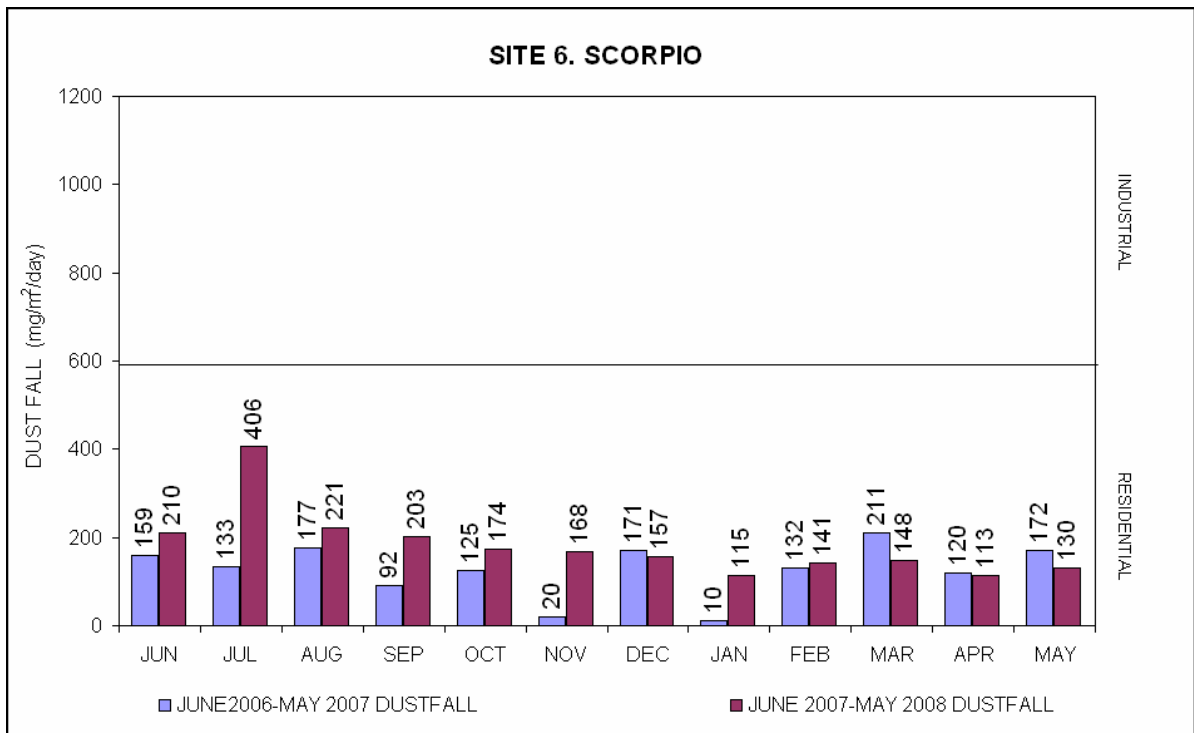
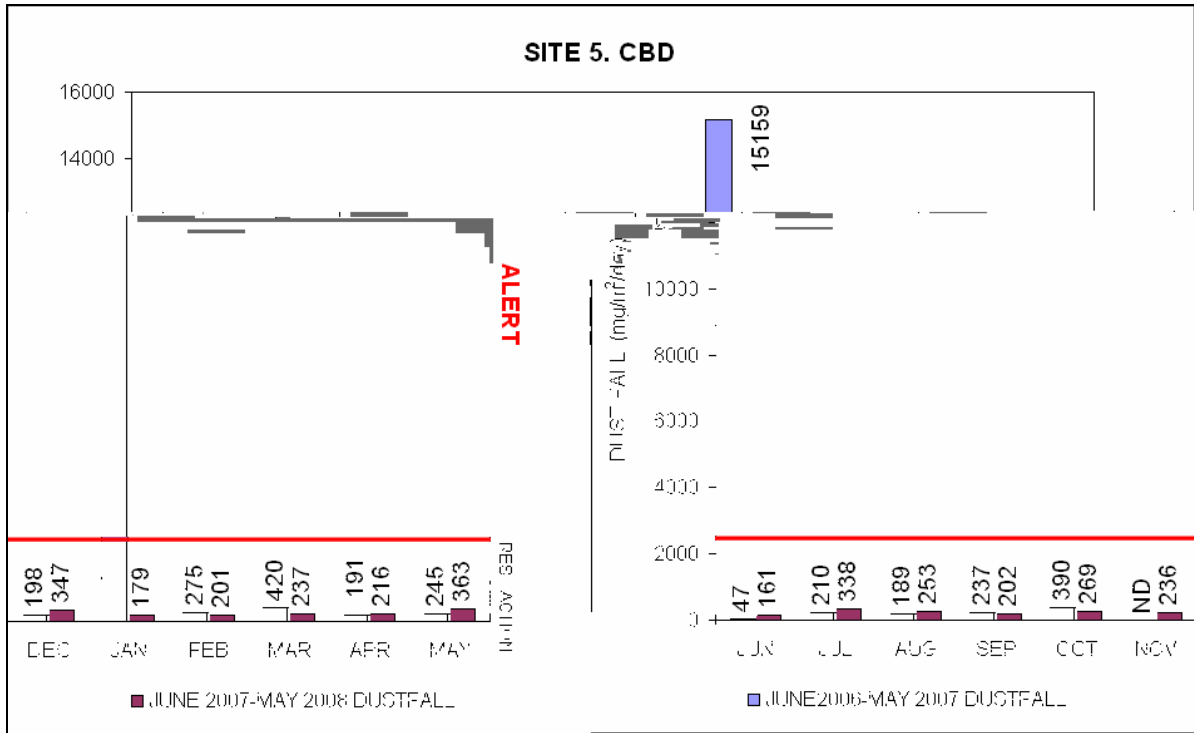
RICHARDS BAY CLEAN AIR ASSOCIATION DUSTFALL MONITORING			Month: May 2008 Sampling period: 17 April – 19 May 2008		
SITE DESCRIPTION	SITE No.	FILTER CODE	NETT MASS (mg)	No. DAYS	DUST FALLOUT (mg/m ² /day)
Brackenham	1	RBCAA 08/121	ND	ND	ND
SAPS Garage	2	RBCAA 08/122	42	32	57
Alton South West	3	RBCAA 08/123	125	32	171
Harbour West	4	RBCAA 08/124	97	32	133
CBD(Municipal office)	5	RBCAA 08/125	263	32	363
Scorpio	6	RBCAA 08/126	95	32	130
Alton fire station	7	RBCAA 08/127	79	32	108
Nseleni Municipal office	8	RBCAA 08/128	110	32	152
Empangeni police station	9	RBCAA 08/129	37	32	50
Felixton Village	10	RBCAA 08/130	30	32	41
Arboretum	11	RBCAA 08/131	118	32	163
Meerensee School	12	RBCAA 08/132	52	32	72

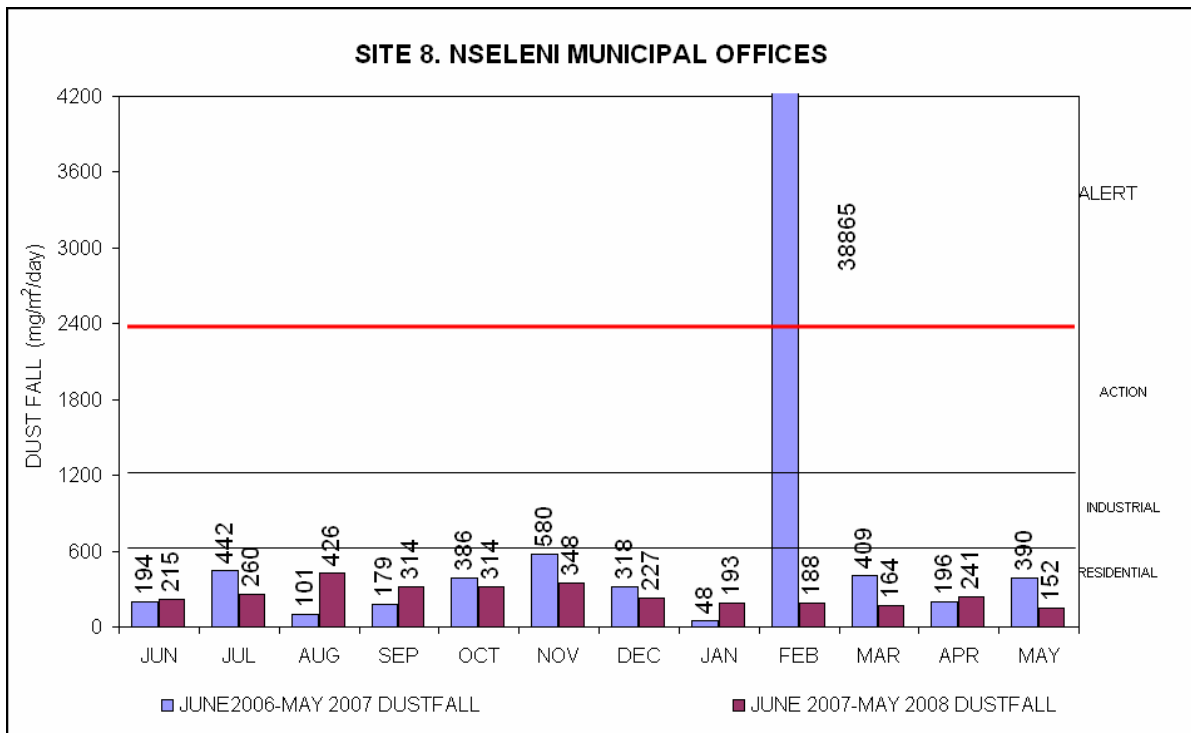
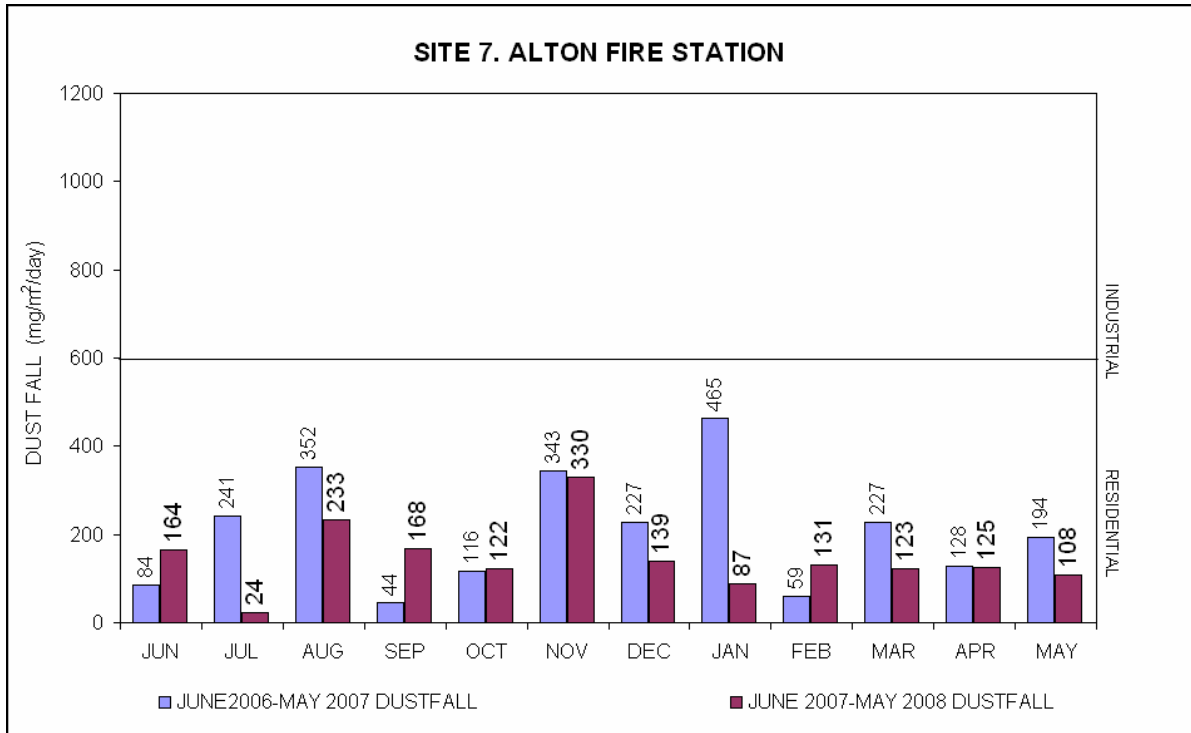
Comments: ND; No data recorded as the bucket was damaged.

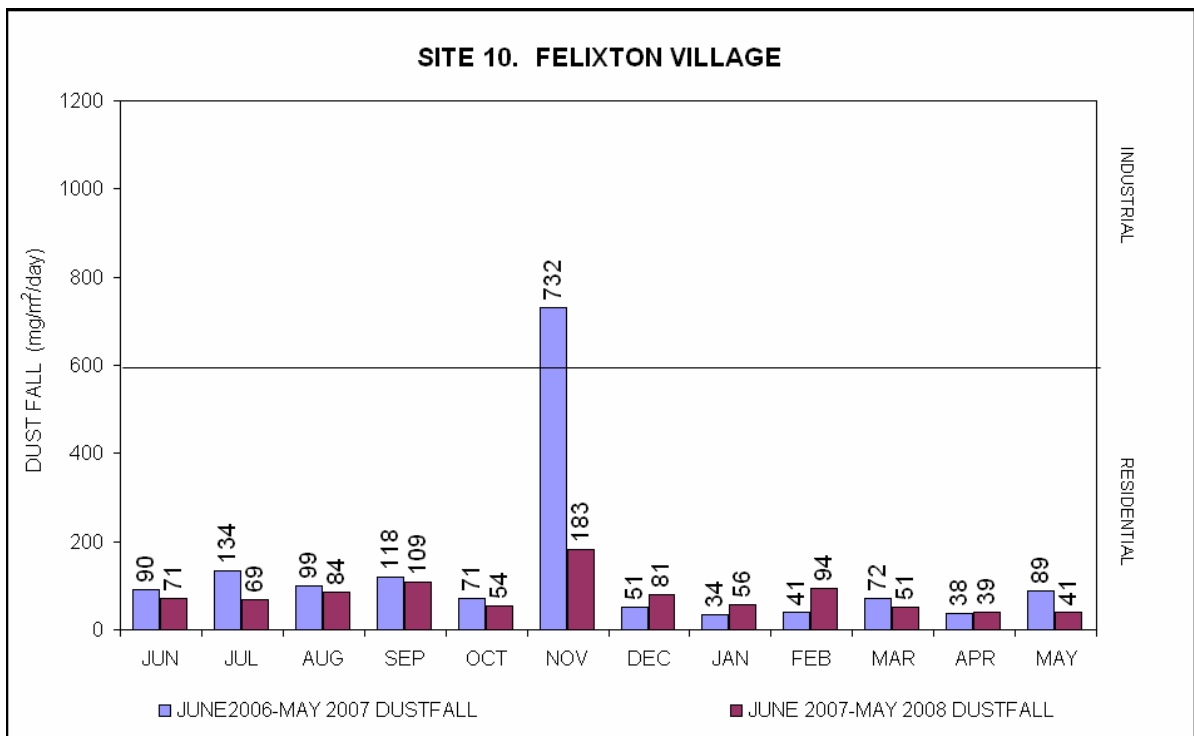
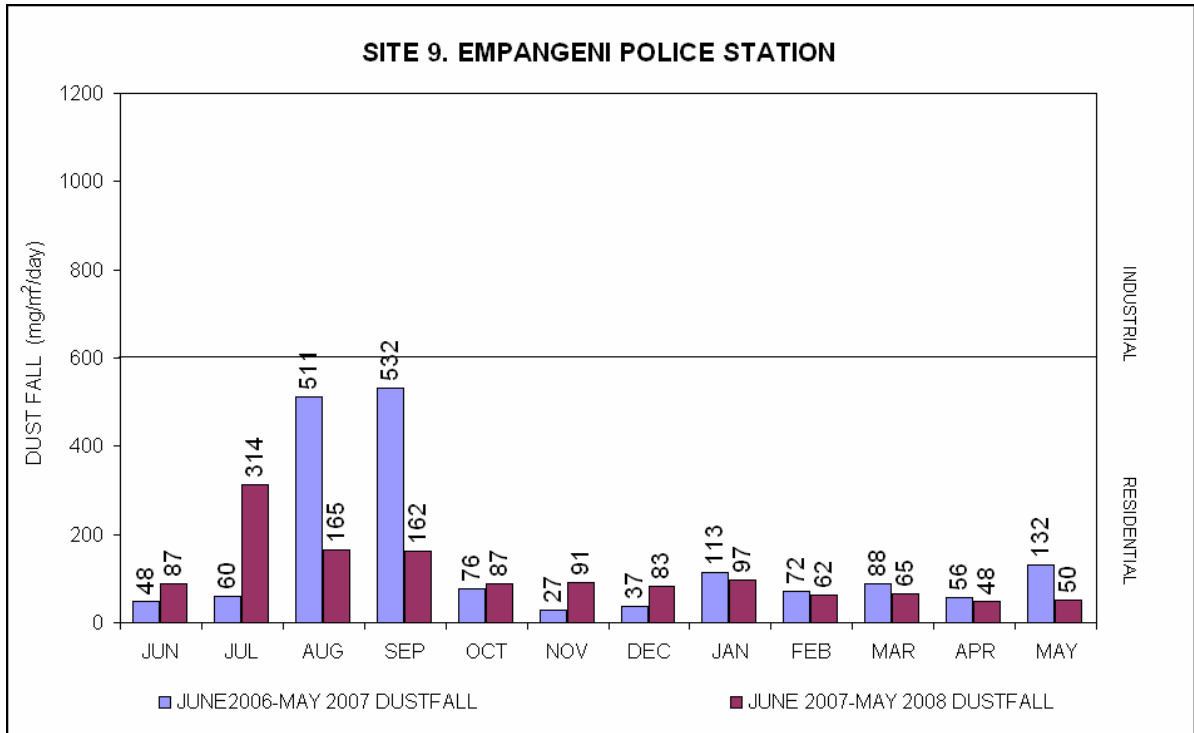
APPENDIX A RBCAA DUST FALLOUT MONTHLY TIMEPLOTS 2006 – 2008

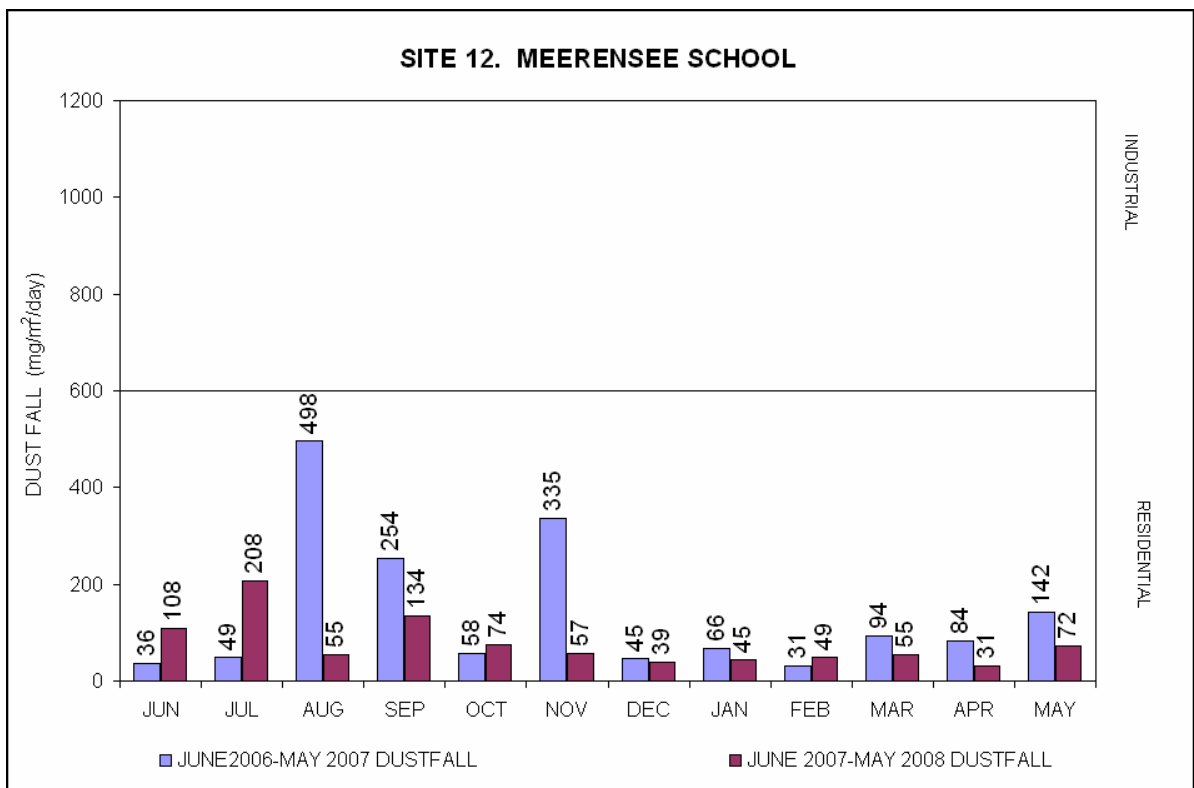
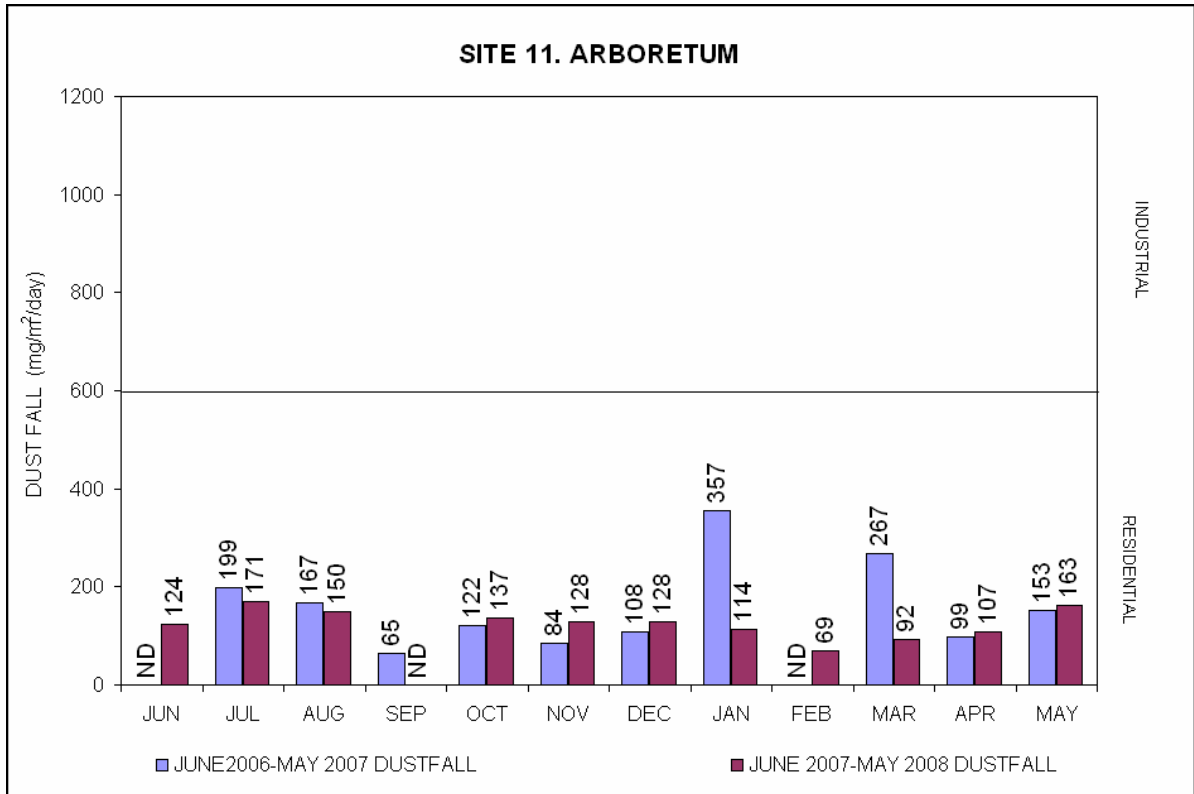












APPENDIX B

