RICHARDS BAY CLEAN AIR ASSOCIATION

DUSTFALL MONITORING

FEBRUARY 2008

Sampling period: 23 January 22 February 2008

Monthly Progress Report

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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 course 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 23 January to 22 February 2008 and samples were exposed for 30 days. The period complies with the standard exposure period of 30 ± 3 days. No operational problems were encountered in February monitoring month and a valid sample return of 100% was achieved. It was reported that there is construction near Site 5 (CBD (Municipal Offices) and Site 6 (Scorpio).

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 mg/m^2/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) (mg/m^2/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. New dustfall standards, target, action and alert thresholds for dust deposition (SANS 1929:2005).

Level	Dustfall Rate (mg/m^2/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 Application of standards

Dust deposition rates recorded at RBCAA are appraised according to the standards published by the Standards South Africa (SANS 1929:2005). Dustfall rates within the RESIDENTIAL and INDUSTRIAL ranges do not result in complaints from the public. ACTION and ALERT ranges, generally result in complaints from the public, and therefore considered to be action levels, at which sources of excessive dust must be investigated (if not known) and suitable mitigation measures instituted.

3. RESULTS

During the February 2008 monitoring month, all the monitoring sites recorded dustfall rates within the RESIDENTIAL threshold. Site 3 (Alton South West) recorded the highest dustfall rate of 372 mg/m^2/day. Site 12 (Meerensee School) recorded the lowest dustfall rate of 49 mg/m^2/day, all within that range. Trends of the dust fallout results per site are presented in Appendix A of this report.

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

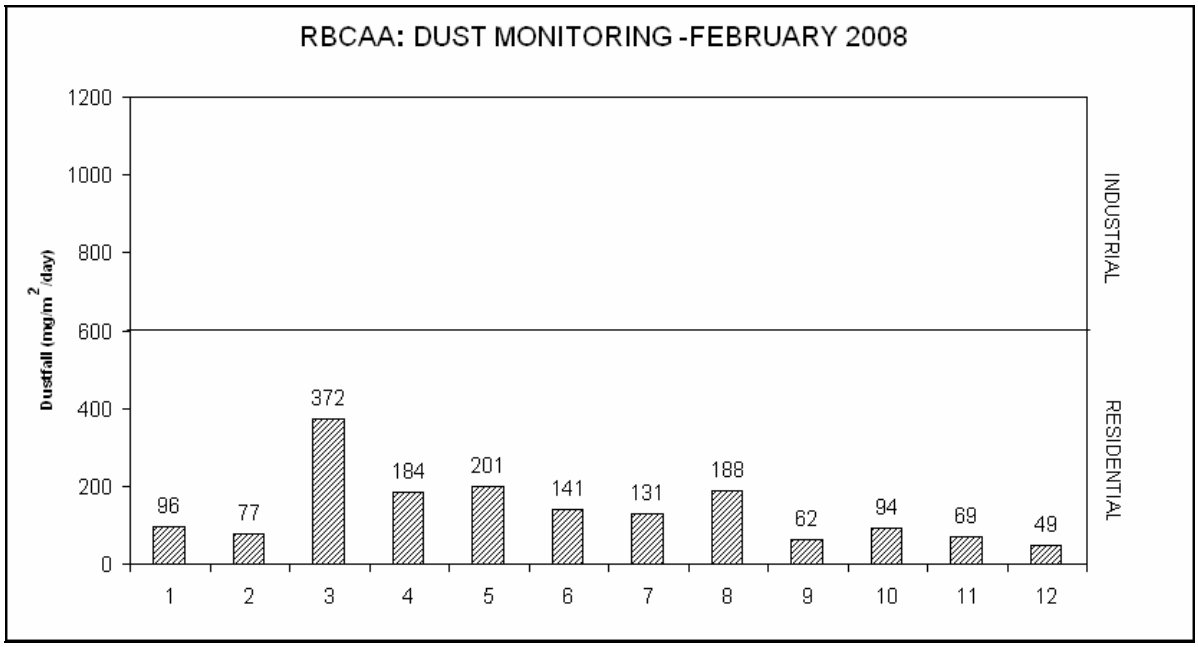
For AER (Pty) Ltd

Report compiled by H. Nuwarinda

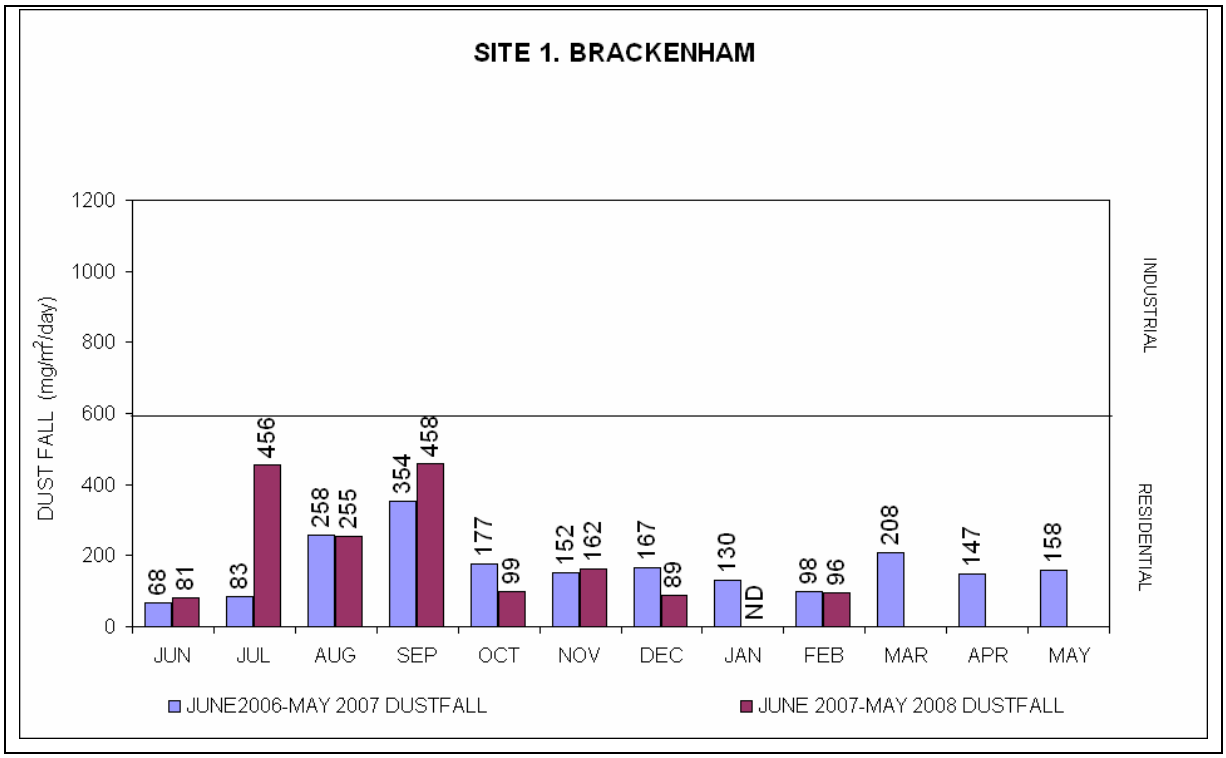
APPENDIX A

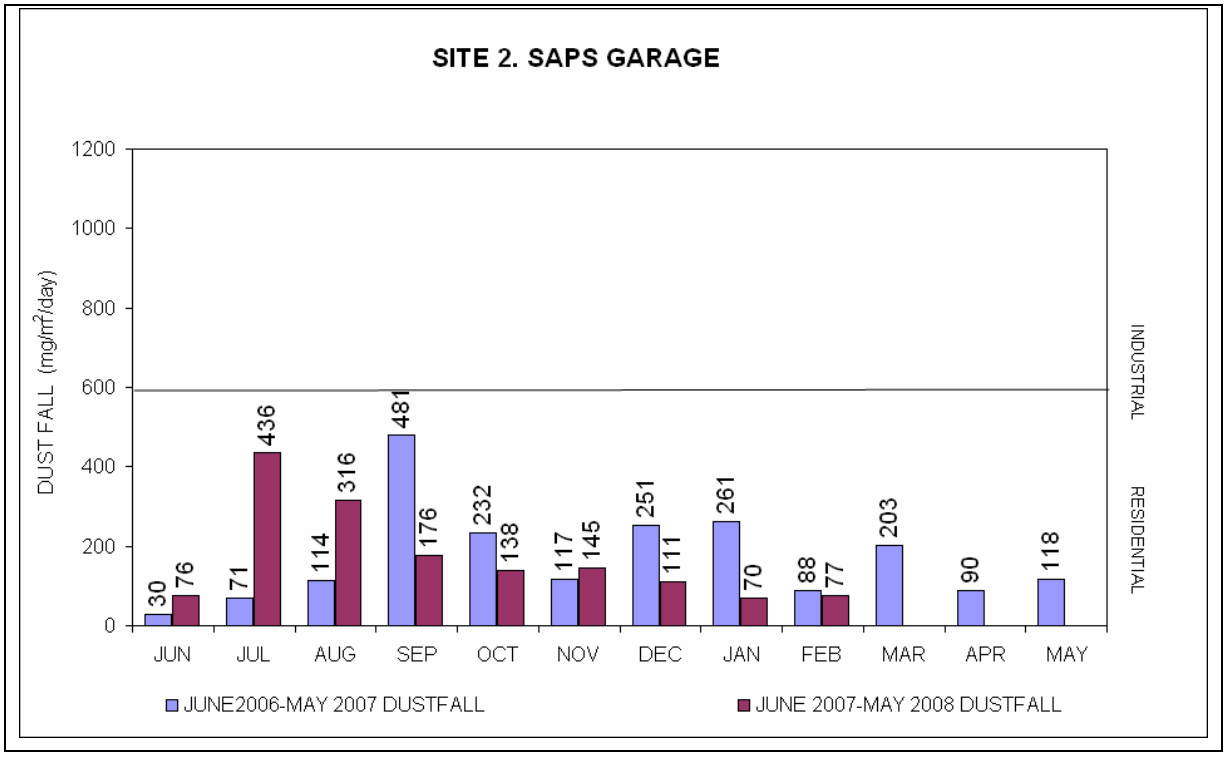
RBCAA DUST FALLOUT MONTHLY TIMEPLOTS 2006 – 2008

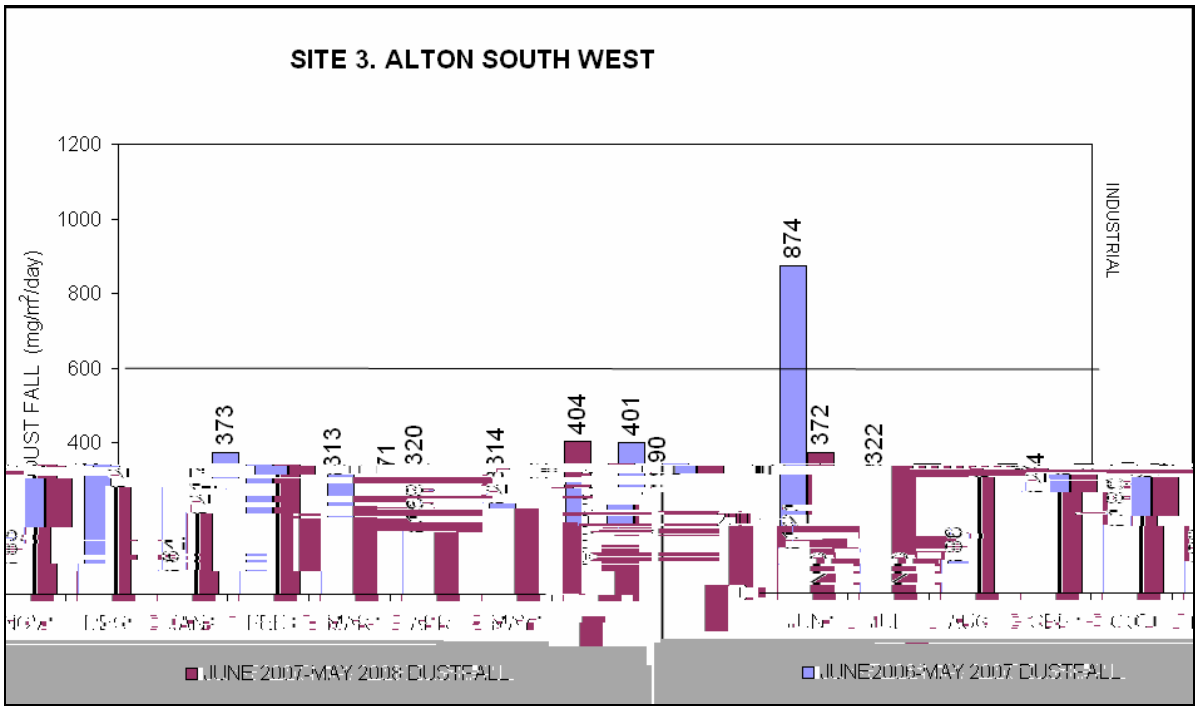
Figure 1: Graph showing results from all sites February 2008

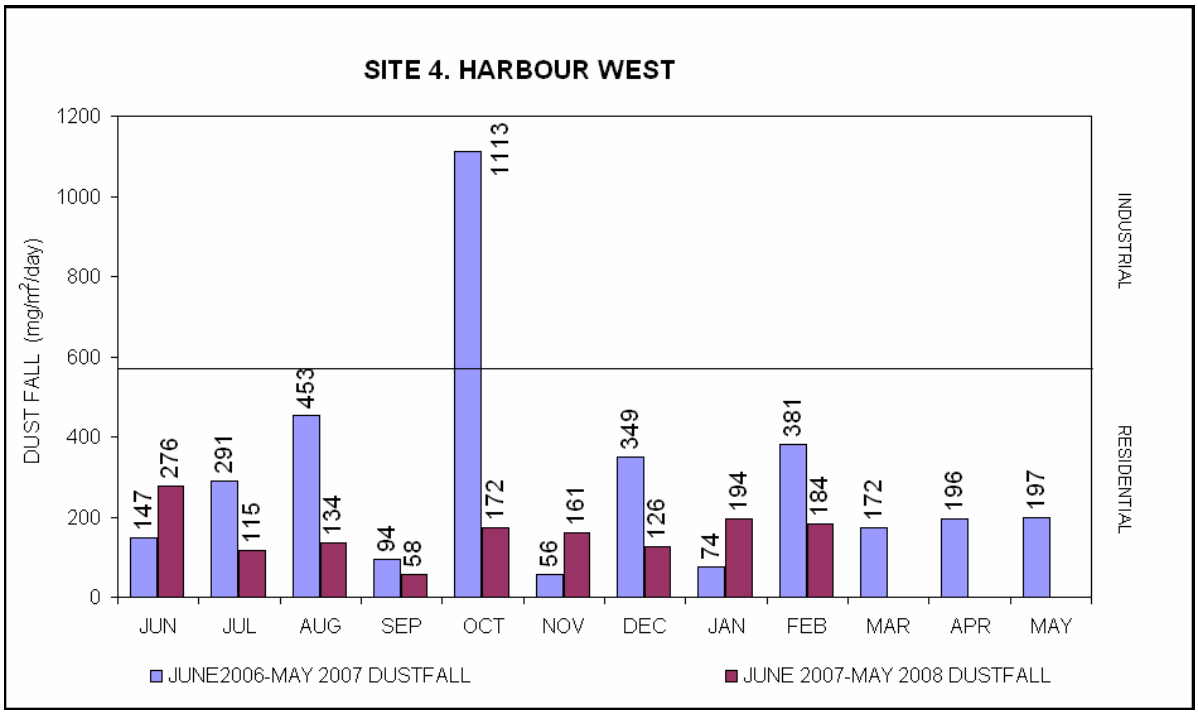


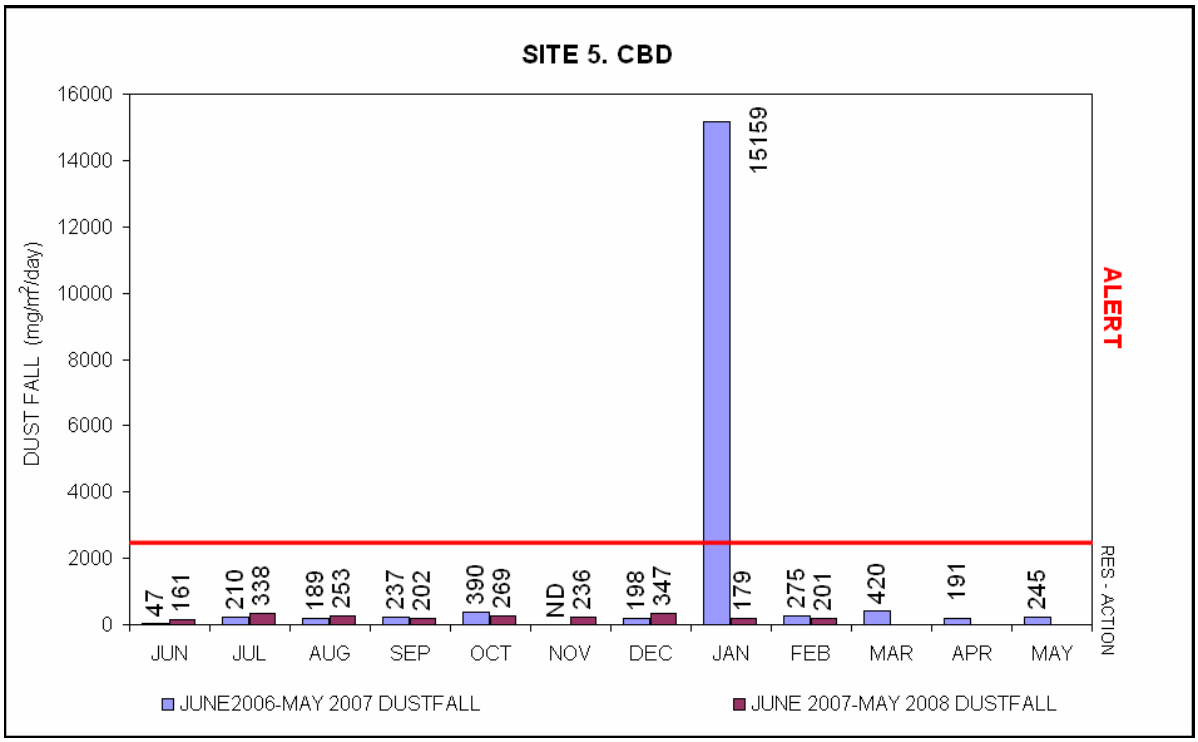
RICHARDS BAY CLEAN AIR ASSOCIATION DUSTFALL MONITORING			Month: February 2008 Sampling period: 23 January 22 February 2008		
SITE DESCRIPTION	SITE No.	FILTER CODE	NETT MASS (mg)	No. DAYS	DUST FALLOUT ($mg/m^2/day$)
Brackenham	1	RBCAA 08/85	65	30	96
SAPS Garage	2	RBCAA 08/86	52	30	77
Alton South West	3	RBCAA 08/87	253	30	372
Harbour West	4	RBCAA 08/88	126	30	184
CBD(Municipal office)	5	RBCAA 08/89	137	30	201
Scorpio	6	RBCAA 08/90	96	30	141
Alton fire station	7	RBCAA 08/91	89	30	131
Nseleni Municipal office	8	RBCAA 08/92	128	30	188
Empangeni police station	9	RBCAA 08/93	42	30	62
Felixton Village	10	RBCAA 08/94	63	30	94
Arboretum	11	RBCAA 08/95	47	30	69
Meerensee School	12	RBCAA 08/96	34	30	49
COMMENTS:					

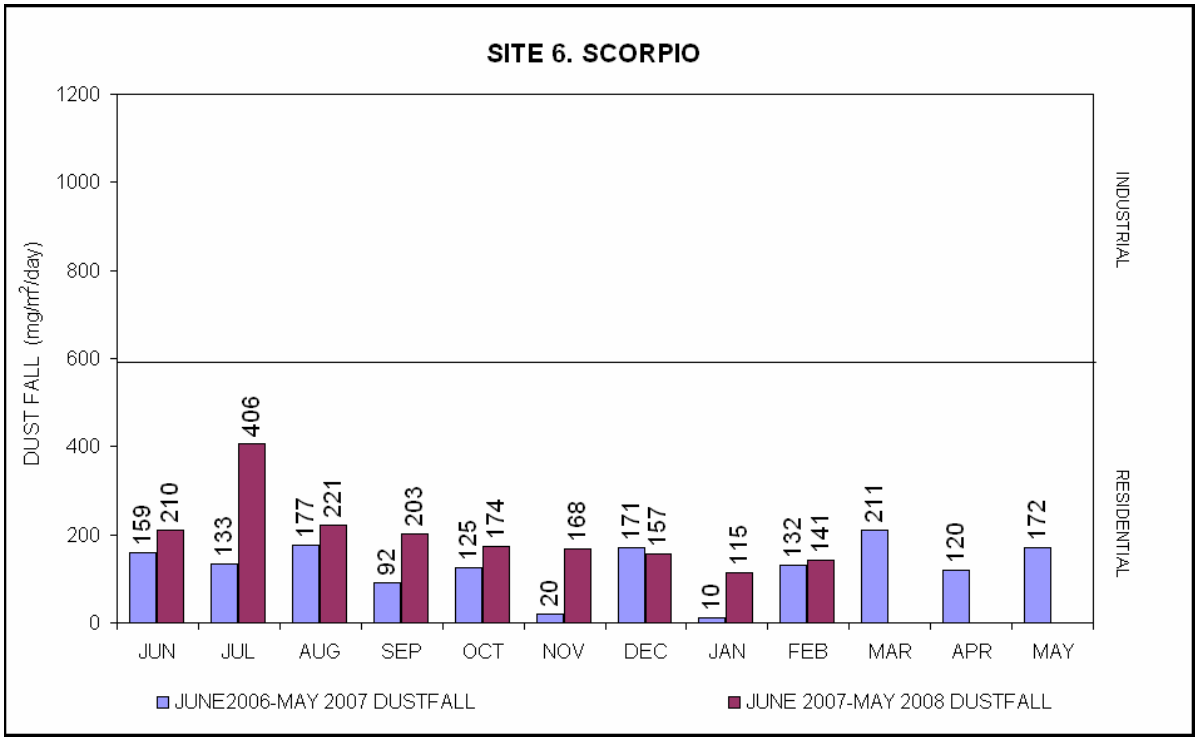

SITE 1. BRACKENHAM
DUST FALL (mg/m²/day)
1200
1000
800
600
400
200
0
68 81
83 456
258 255
354 458
177 99
152 162
167 89
130 ND
98 96
208
147
158
JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY
INDUSTRIAL
RESIDENTIAL
JUNE2006-MAY 2007 DUSTFALL
JUNE 2007-MAY 2008 DUSTFALL

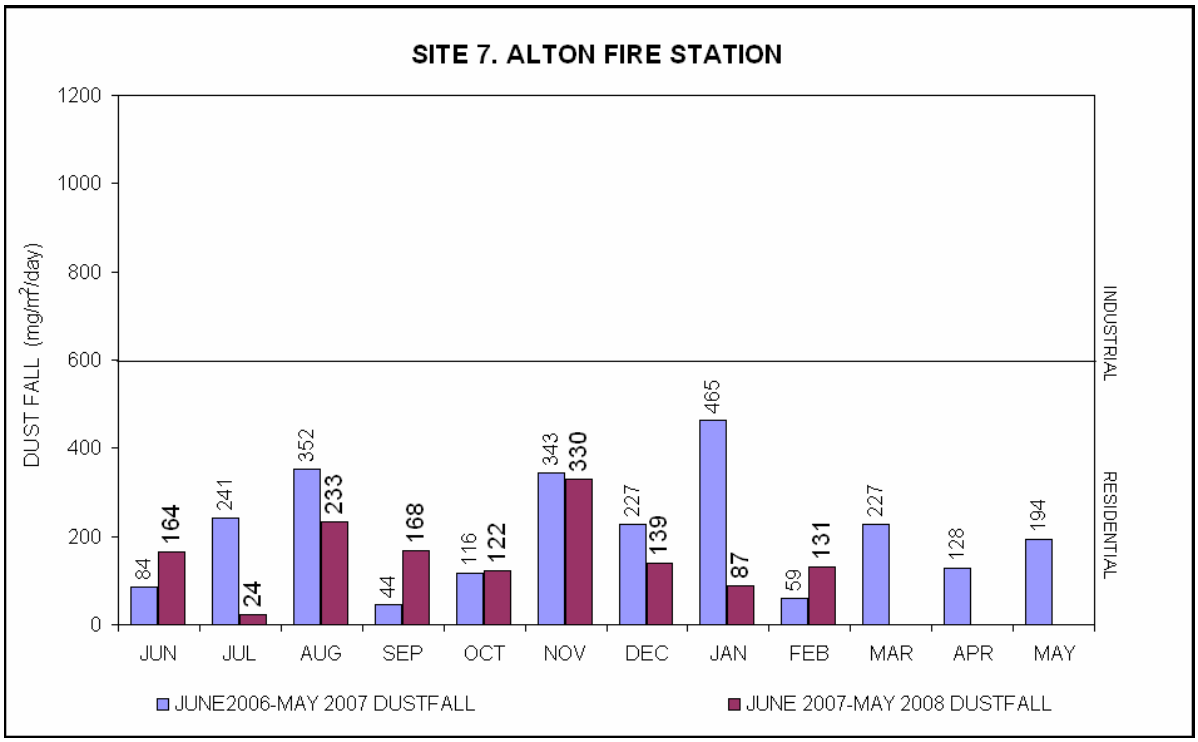

SITE 2. SAPS GARAGE
DUST FALL (mg/m²/day)
1200
1000
800
600
400
200
0
30 76
71 436
114 316
481 176
232 138
117 145
251 111
261 70
88 77
203
90
118
JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY
INDUSTRIAL
RESIDENTIAL
JUNE2006-MAY 2007 DUSTFALL
JUNE 2007-MAY 2008 DUSTFALL

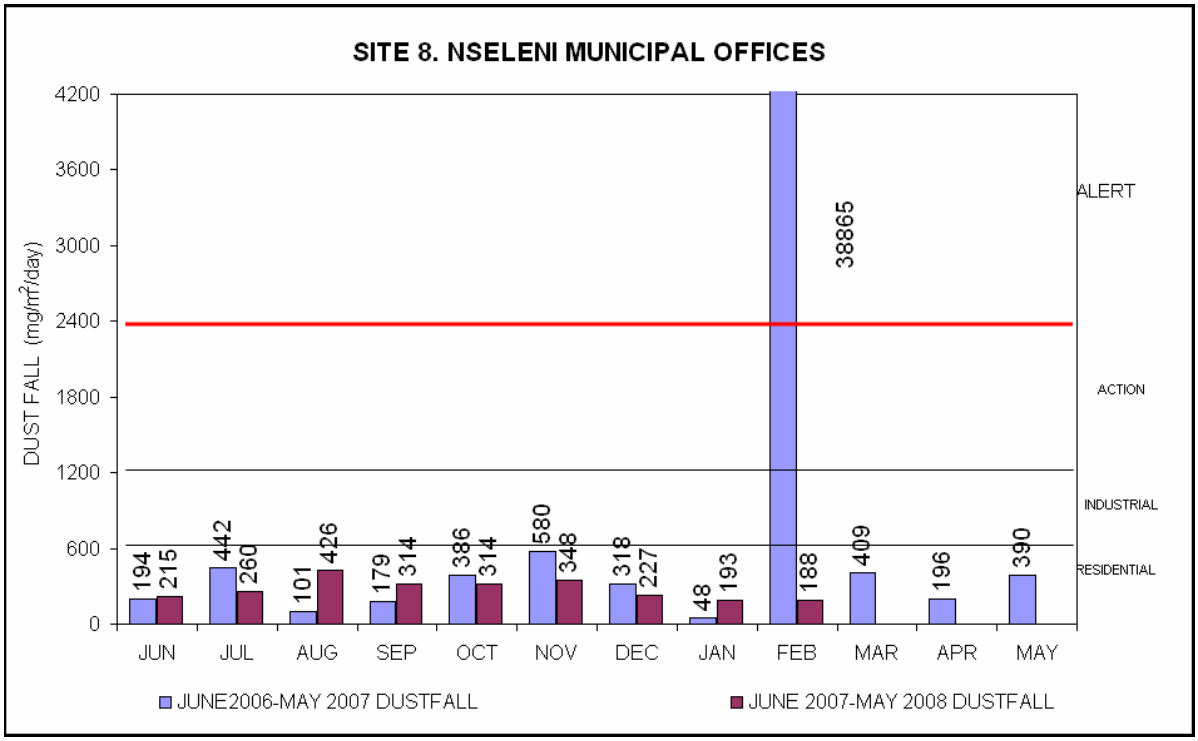

SITE 3. ALTON SOUTH WEST
1200
1000
800
600
400
373
313
320
314
404
401
874
372
322
INDUSTRIAL
JUNE 2007-MAY 2008 DUSTFALL
JUNE2006-MAY 2007 DUSTFALL

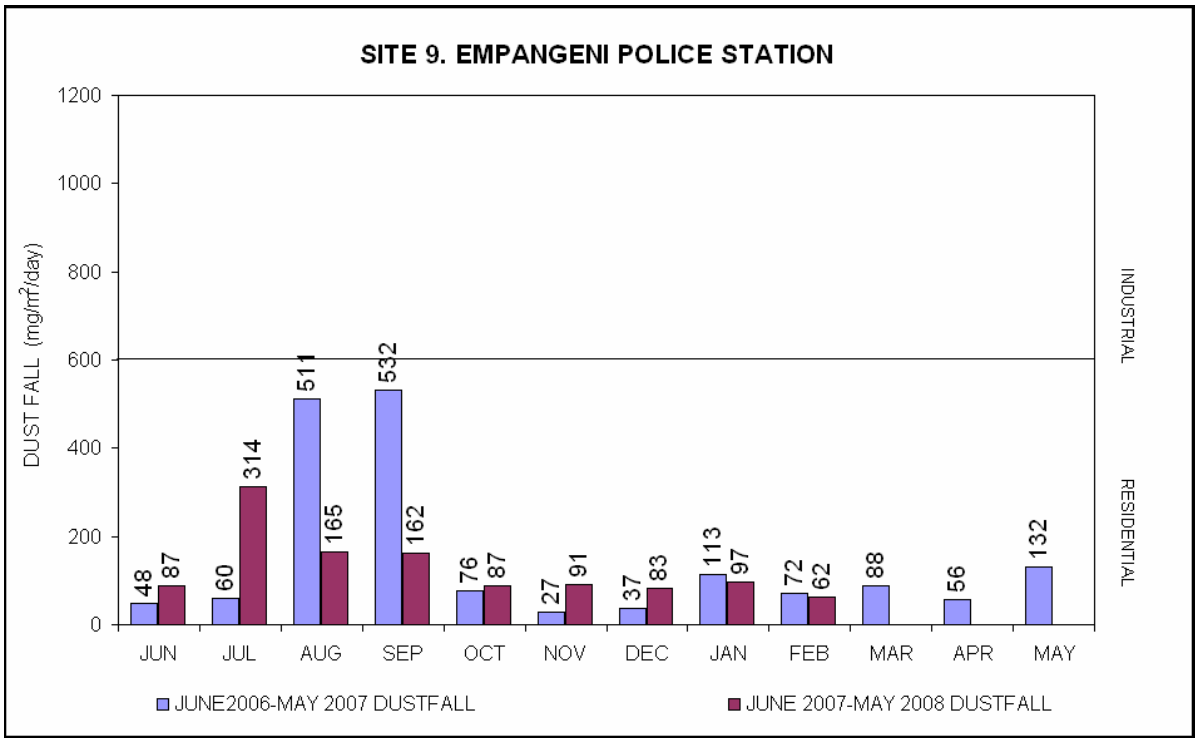

SITE 4. HARBOUR WEST
DUST FALL (mg/m²/day)
1200
1000
800
600
400
200
0
147
276
291
115
453
134
94
58
1113
172
56
161
349
126
74
194
381
184
172
196
197
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
INDUSTRIAL
RESIDENTIAL
JUNE2006-MAY 2007 DUSTFALL
JUNE 2007-MAY 2008 DUSTFALL

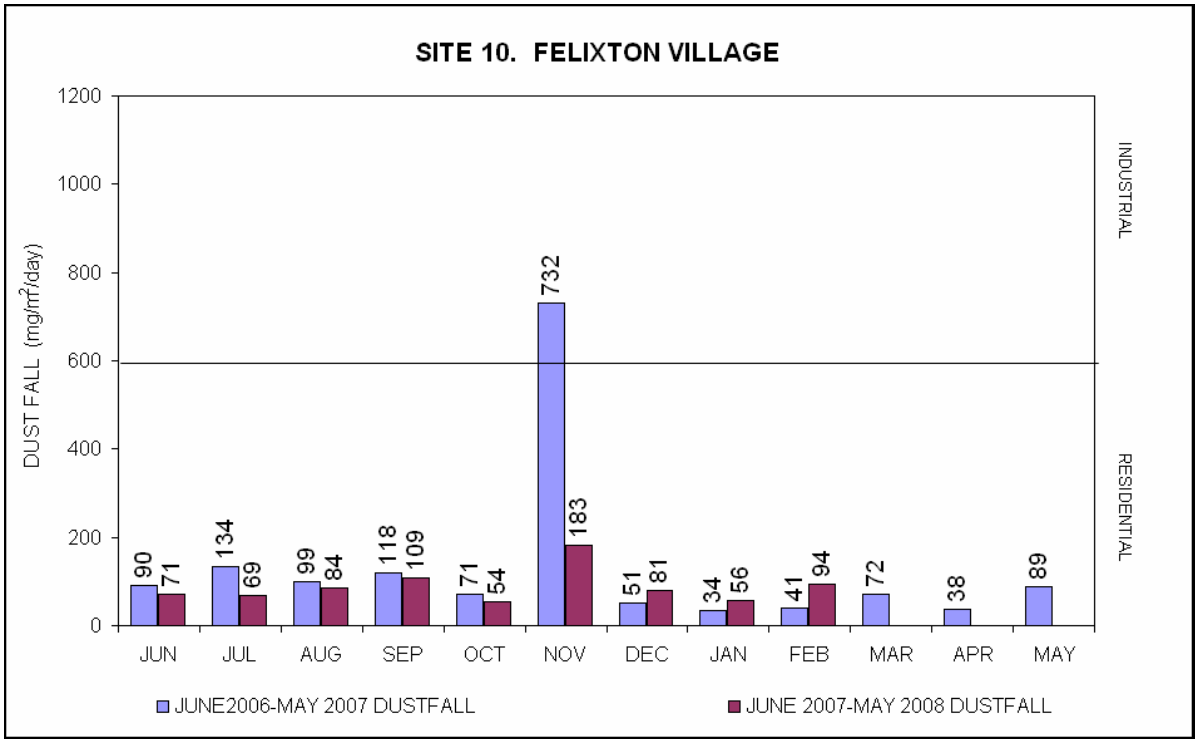

SITE 5. CBD
DUST FALL (mg/m²/day)
16000
14000
12000
10000
8000
6000
4000
2000
0
47
161
210
338
189
253
237
202
390
269
ND
236
198
347
15159
179
275
201
420
191
245
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
ALERT
RES - ACTION
JUNE2006-MAY 2007 DUSTFALL
JUNE 2007-MAY 2008 DUSTFALL

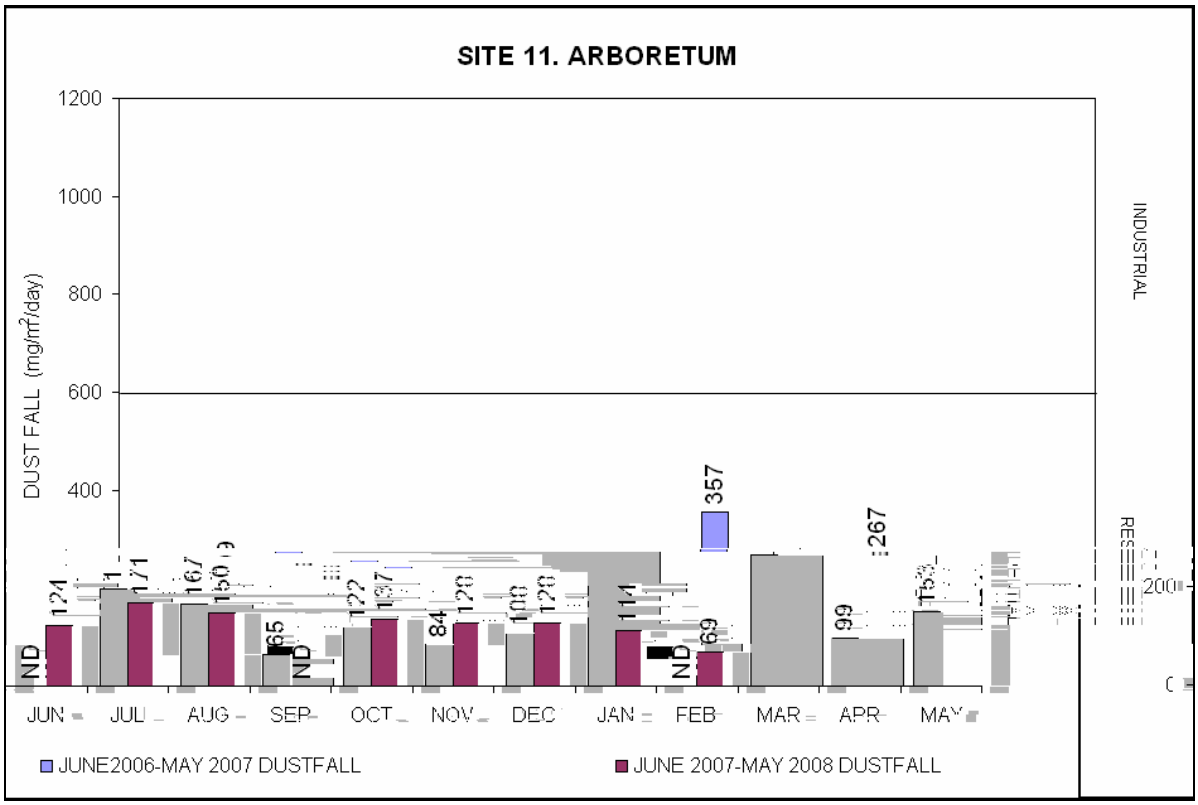

SITE 6. SCORPIO
DUST FALL (mg/m²/day)
1200
1000
800
600
400
200
0
159
210
133
406
177
221
92
203
125
174
20
168
171
157
10
115
132
141
211
120
172
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
INDUSTRIAL
RESIDENTIAL
JUNE2006-MAY 2007 DUSTFALL
JUNE 2007-MAY 2008 DUSTFALL

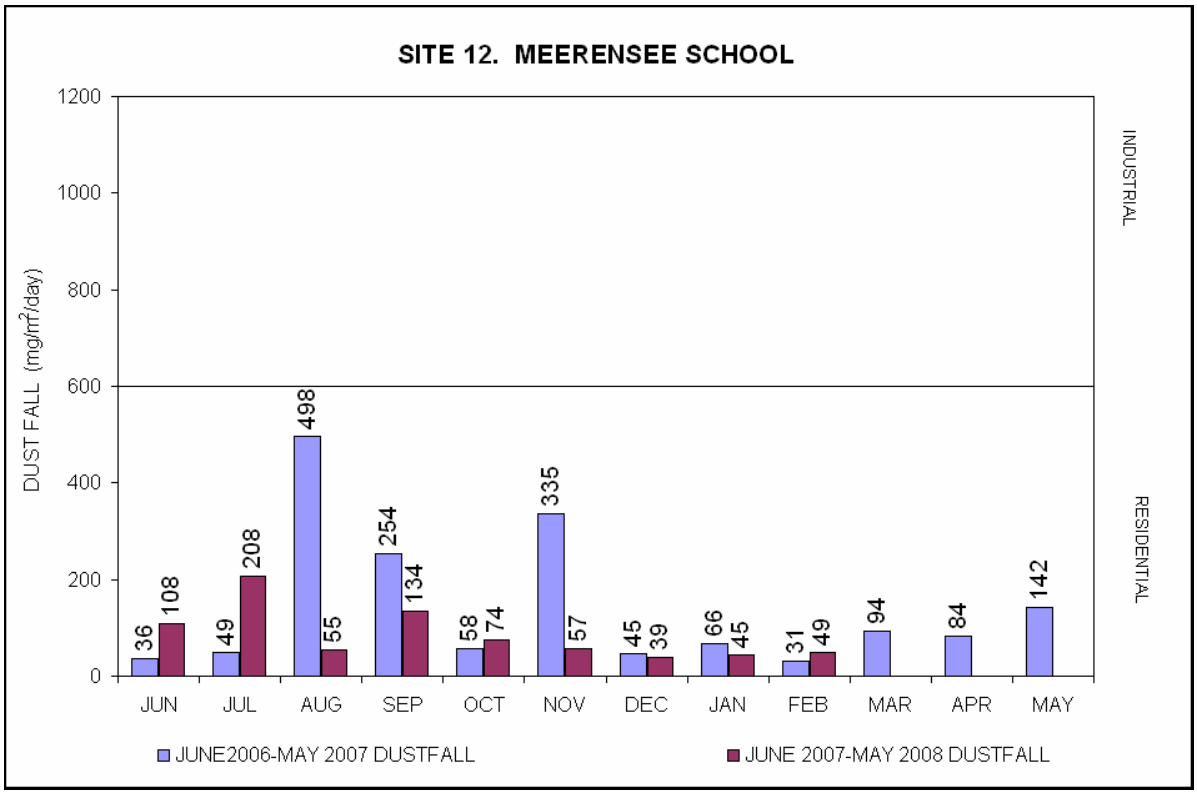

SITE 7. ALTON FIRE STATION
DUST FALL (mg/m²/day)
1200
1000
800
600
400
200
0
JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY
84 164
241 24
352 233
44 168
116 122
343 330
227 139
465 87
59 131
227
128
194
INDUSTRIAL
RESIDENTIAL
JUNE2006-MAY 2007 DUSTFALL
JUNE 2007-MAY 2008 DUSTFALL


SITE 8. NSELENI MUNICIPAL OFFICES
DUST FALL (mg/m²/day)
4200
3600
3000
2400
1800
1200
600
0
JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY
194 215
442 260
101 426
179 314
386 314
580 348
318 227
48 193
38865 188
409
196
390
ALERT
ACTION
INDUSTRIAL
RESIDENTIAL
JUNE2006-MAY 2007 DUSTFALL
JUNE 2007-MAY 2008 DUSTFALL


SITE 9. EMPANGENI POLICE STATION
DUST FALL (mg/m²/day)
1200
1000
800
600
400
200
0
48 87
60 314
511 165
532 162
76 87
27 91
37 83
113 97
72 62
88
56
132
JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY
INDUSTRIAL
RESIDENTIAL
JUNE2006-MAY 2007 DUSTFALL
JUNE 2007-MAY 2008 DUSTFALL


SITE 10. FELIXTON VILLAGE
DUST FALL (mg/m²/day)
1200
1000
800
600
400
200
0
90 71
134 69
99 84
118 109
71 54
732 183
51 81
34 56
41 94
72
38
89
JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY
INDUSTRIAL
RESIDENTIAL
JUNE2006-MAY 2007 DUSTFALL
JUNE 2007-MAY 2008 DUSTFALL


SITE 11. ARBORETUM
DUST FALL (mg/m²/day)
1200
1000
800
600
400
200
0
INDUSTRIAL
RESIDENTIAL
ND
124
171
167
150
65
ND
122
137
84
120
103
120
111
ND
69
357
267
99
153
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUNE2006-MAY 2007 DUSTFALL
JUNE 2007-MAY 2008 DUSTFALL


SITE 12. MEERENSEE SCHOOL
DUST FALL (mg/m²/day)
1200
1000
800
600
400
200
0
INDUSTRIAL
RESIDENTIAL
36
108
49
208
498
55
254
134
58
74
335
57
45
39
66
45
31
49
94
84
142
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
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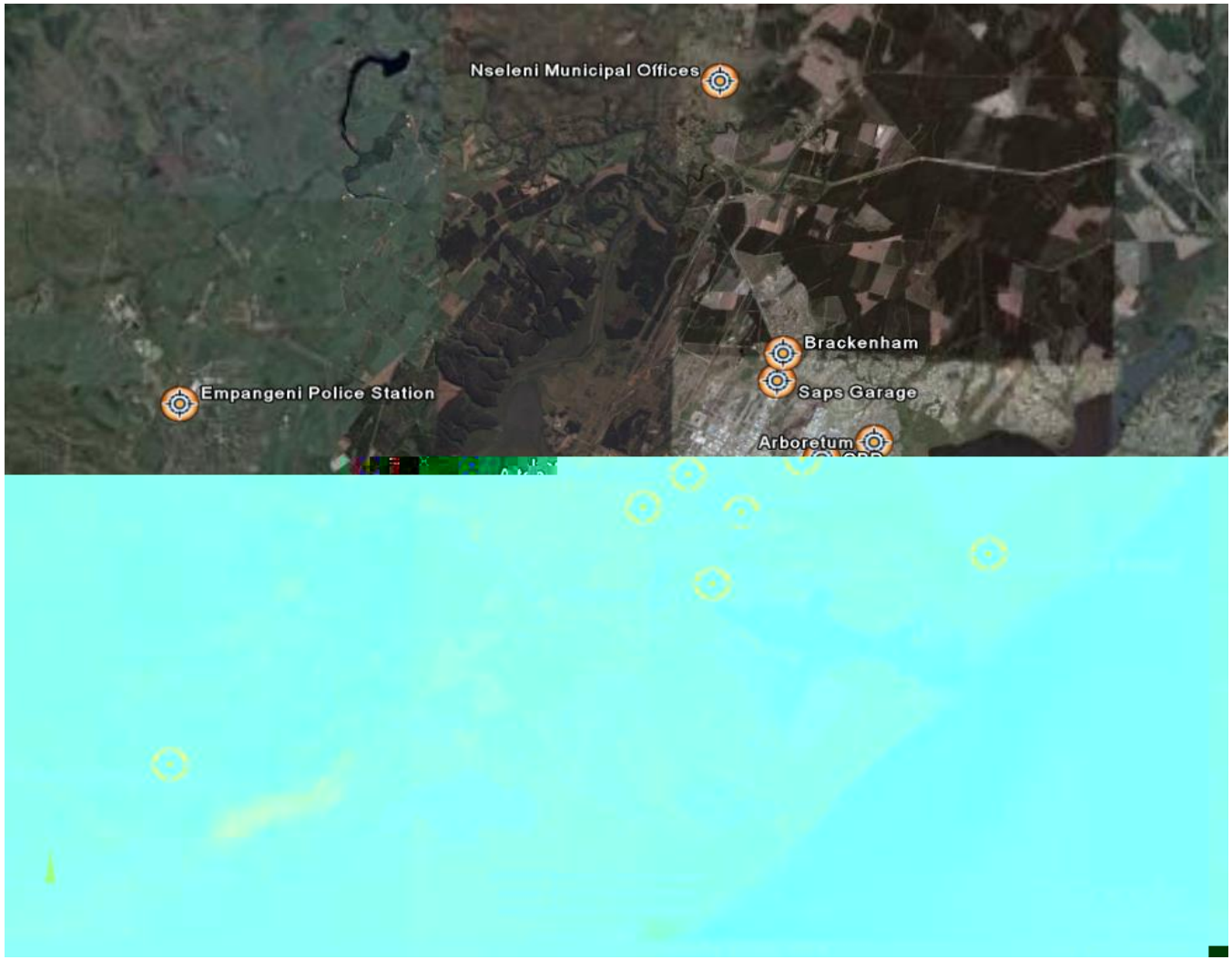
MAY
JUNE2006-MAY 2007 DUSTFALL
JUNE 2007-MAY 2008 DUSTFALL

APPENDIX B


Nseleni Municipal Offices
Brackenham
Saps Garage
Empangeni Police Station
Arboretum