Neath Port Talbot County Borough Council

Air quality report – 2001

FIFTH ANNUAL REPORT (2001)

The purpose of this report is to present the results of all pollution monitoring data collected during the calendar year 2001. The data includes results from continuous and non-continuous equipment, some of which is supplied to national pollution monitoring networks. Conclusions are drawn about air quality based upon this information.

EXECUTIVE SUMMARY

Overall the air quality in Neath and Port Talbot met the National Assembly for Wales Air Quality (Wales) 2000 Regulations Objective Levels with the exception of PM_{10} particles in the Taibach/Margam area which is currently an Air Quality Management Area.

Problems still remain with iron-rich nuisance dust in the Taibach and Margam areas, which will require liaison with the Environment Agency Wales. Vigilance and monitoring continues be required to ensure processes under local authority regulation such as opencast sites and washeries continue to remain in control with regard to the suppression of dust. However, a number of sites continue to show encouraging downward trends.

The metals monitoring at Pontardawe continues to show the influence of the nickel smelter at Clydach. The nickel concentration in 2001 remains largely unchanged, but the measured concentration is approximately twice the proposed Daughter Directive Limit value. This information has been brought to the attention of the Environment Agency.

Monitoring of volatile organic compounds (VOC's) at Baglan has shown a further reduction in ethylene levels although ethylene usage eventually stopped during 2002.

Contents

Grit and dust monitoring

Previous reports have described how deposit gauges have been used to collect atmospheric fallout from a number of locations. The analysis of the collected grit and dust is not confined to the fallout rate, but also includes a sophisticated characterisation of the deposit, using Scanning Electron Microscopy (SEM) and Energy Dispersive X-ray Analysis (EDXA). During 2001, sampling of this kind took place at 13 sites in the County Borough.

The report includes results from the following locations:

- Prince Street, Margam, Port Talbot
- Baldwins Crescent, Crymlyn Burrows
- Ffrwdwyllt House, Margam Road, Port Talbot
- Wembley Avenue, Onllwyn
- Eglwys Nunydd Reservoir, Margam, Port Talbot
- Little Warren, Port Talbot.
- Cwmllynfell, Amman Valley
- Tairgwaith, Amman Valley
- Llygad yr Haul, Glynneath
- Gwaun Cae Gurwen, Amman Valley
- Cil Carne Farm, Bryn, Port Talbot
- Cardonnel Road Skewen
- Parish Road, Cwmgwrach

Once again, the report consists of pie charts and time series graphs for each site for 2001 and the preceding year as a comparison. The pie charts show the average percentage composition of the samples collected during the year, with the average fallout rates of each component in $mg/m^2/day$ underneath. The time series show how the fallout rate has changed over the course of the year. The pie charts define the composition of the collected deposit into the following categories:

- Coal – unburned coal.
- Carbonised – partly burnt carbon based material that may be derived from combustion of coal, oil, wood etc.
- Sand – sand and silica based minerals.
- Dirt – mineral material typically found in soil and earth.
- Fly Ash – spherical mineral particles having arisen from combustion.
- Plant/Animal – miscellaneous fragments of insects, plant material etc.
- Calcium Rich – particles with an unusually high calcium content e.g. chalk, cement etc.
- Iron Rich – particles consisting of, or rich in iron.
- Others – anything not falling into the categories above.

Additional information is provided to indicate the annual average and maximum fallout levels, the data capture rate, and the number of days exceeding (or within 10% of) the “nuisance limit” (200 $mg/m^2/day$), which some recognise as relevant for this method of monitoring. However it should be noted that this “limit” is not a statutory limit and the public perception of what constitutes a nuisance might now suggest that a lower “limit” would be appropriate.

The sites are ranked in a table and graphically according to the average fallout rate. Also, for the second time, a table and graph has been generated to summarise how annual fallout rates have

changed at each location since monitoring began. A map showing the locations of each of the monitoring sites is also shown. Figures 1 to 26 comprise pairs of time series and pie charts for each site. The time series charts show how the fallout rate has varied over the period(s) concerned, whilst the pie charts show the average composition. The tables that accompany the charts highlight any differences that may have occurred over the period. Figure 27 shows the location of each of the deposit gauges. Figure 28 shows the average fallout rate for each site during 2001 in a bar chart, and Table 1 holds the data for this chart. Figure 29 and Table 2 show how fallout rates have varied in the long term.

Results by site

Baldwins Crescent, Crymlyn Burrows (Figs. 1 & 2)

The "nuisance limit" was not exceeded in 2001 and no samples reached within 10% of 200 mg/m^2/day. The maximum fallout rate was 98 mg/m^2/day, and the average 35 mg/m^2/day. There was a 22% decrease in fallout rates compared to the previous year. The decrease was primarily due to falling amounts of plant/animal fragments, coal and sand.

Cil Carne Farm, Bryn, Port Talbot (Figs. 3 & 4)

Only two samples were collected during 2001, owing to the impact of the foot and mouth crisis. It was not possible to gain access to the site for the duration of the problem. Consequently, no significance should be attributed 3rd place ranking of the site during 2001. The small number of results obtained are not sufficient to allow conclusions to be drawn about the results.

Prince Street, Port Talbot (Figs. 5 & 6)

The "nuisance limit" was exceeded in three samples during June, July and October resulting in 92 days where the average fallout rate exceeded 200 mg/m^2/day. This compares with 163 days during the previous year. There were also 37 days during which the results were within 10% of the 200 mg/m^2/day figure, whereas there were none during 2000. The maximum fallout rate was 284 mg/m^2/day. There was a decrease in fallout of 30% during 2001, the annual average being 135 mg/m^2/day. The improvement was mainly due to a significant reduction in iron rich material which reduced from 51% to 43% of the total sample. There were also reductions in calcium rich, plant/animal fragments and coal. The effect of the nearby steel works continues to be the most significant at this site. This site continues to have the highest fallout rate of all those sampled.

Ffrwdwyllt House, Margam Road, Port Talbot (Figs. 7 & 8)

There were 22 days in March 2001 when the "nuisance limit" was exceeded, whereas there were 28 days in 2000. The maximum fallout rate, at 221 mg/m^2/day was also lower than the previous year. There was a substantial 58% decrease in the average fallout rate, which fell from 120 mg/m^2/day to 51 mg/m^2/day. The improvement was mainly due to lower quantities of iron rich material, coal and dirt. The site, which has previously been ranked 2nd, has now dropped to 5th in terms of average fallout.

Eglwys Nunydd Reservoir, Port Talbot (Figs. 9 & 10)
The "nuisance limit" was exceeded on 35 days during September 2001, but no samples reached within 10% of 200 mg/m^2/day. There was a 111% increase in the average fallout rate, which rose from 44 mg/m^2/day in 2000 to 93 mg/m^2/day in 2001. This was mainly due to the effect of one sample where a fallout rate of 453 mg/m^2/day was attained. Increases in plant/animal fragments and iron rich material were the principal factors.

Gwaun Cae Gurwen (Figs. 11 & 12)
The "nuisance limit" was not exceeded and there were no results within 10% of 200 mg/m^2/day. There was a 6% decrease in fallout levels, the average being 31 mg/m^2/day. An increase in the quantities of coal was more than countered by the decreases in plant/animal fragments and dirt.

Cwmllynfell (Figs. 13 & 14)
Like the Cil Carne Farm site, sampling at this rural location was greatly affected by the foot and mouth crisis. Consequently, no significance should be attributed to the small number of results obtained, which are not sufficient from which to draw conclusions.

Tairgwaith (Figs. 15 & 16)
The "nuisance limit" was not exceeded and no samples reached within 10% of 200 mg/m^2/day. There was a 5% increase in fallout rates compared to the previous year. The average fallout level was 23 mg/m^2/day. Decreases in plant/animal fragments were matched by increases in sand. There were also increases in the percentage of dirt.

Parish Road, Cwmgwrach (Figs. 17 & 18)
The "nuisance limit" was not exceeded and no samples reached within 10% of 200 mg/m^2/day. The fallout levels remain low and decreased by 7% over the 2000 levels. The average fallout rate was 28 mg/m^2/day. There was an increase in iron rich material and a greater decrease in plant/animal fragments. There was no change to the quantity of dirt fallout, but changes in other substances resulted in the proportion of this substance rising from 50% to 53% of the total, a trend that has continued in recent years.

Llygad yr Haul, Glynneath (Figs. 19 & 20)
The "nuisance limit" was not exceeded and no samples reached within 10% of 200 mg/m^2/day. The average fallout rate was 21 mg/m^2/day, a reduction of 36% over the substantially raised levels encountered during 2000. The decrease was mainly due to lower quantities of plant/animal fragments.

Wembley Avenue, Onllwyn (Figs. 21 & 22)
The "nuisance limit" was not exceeded during 2000 exceeded and no samples reached within 10% of 200 mg/m^2/day. Average fallout levels at 53 mg/m^2/day, increased by 18% during 2001, reversing the 22% decrease of the previous year. There were increases in coal and dirt, but decreases in plant/animal fragments. The increases in coal fallout particularly unwelcome as it the proportion of coal has risen to 57% of the average sample. The effect of the nearby coal washery remains strong and increased during 2001.

Cardonnel Road, Skewen (Figs. 23 & 24)
The "nuisance limit" was not exceeded and no samples reached within 10% of 200 mg/m^2/day. The fallout rate averaged 33 mg/m^2/day, some 38% up on 2000. The increase was mainly due to more coal and to a lesser extent dirt.

Little Warren, Port Talbot (Figs. 25 & 26)
The “nuisance limit” was not exceeded and no samples reached within 10% of 200 mg/m2/day. The average fallout rate, at 46 mg/m2/day was 30% lower than that during 2000. The main cause for the decrease was a substantial lowering of the iron rich material.

Figure 1

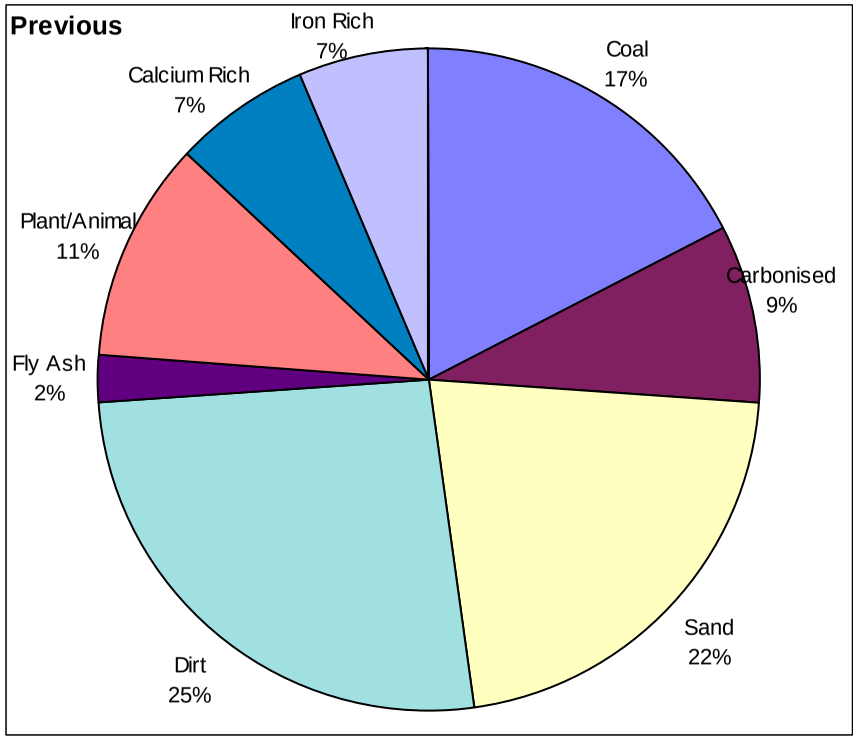
Deposit Gauge Analysis Report

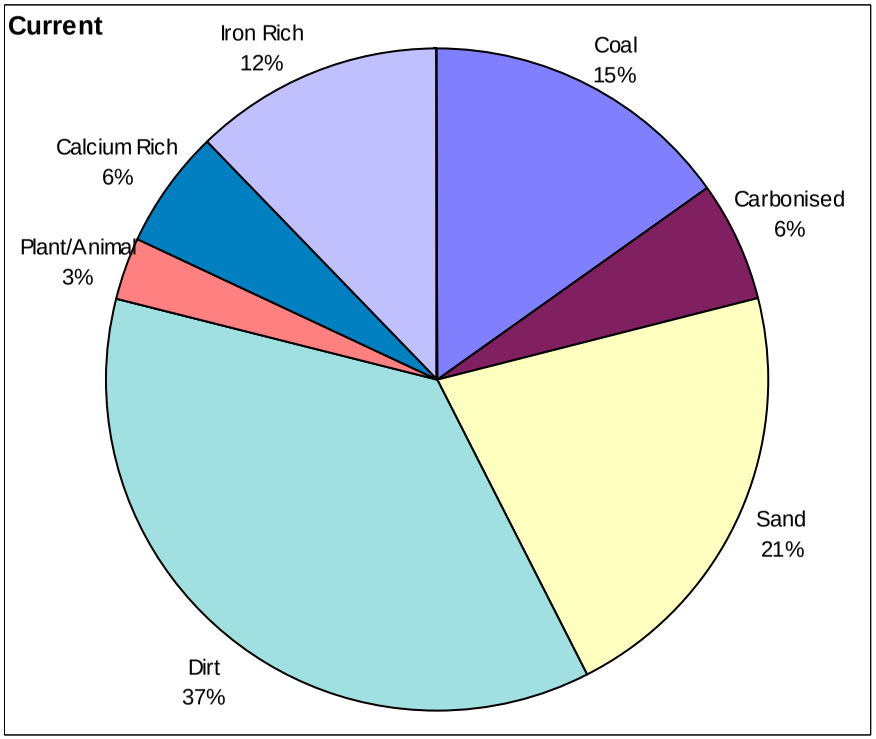
Jeremy's Oil Distributors, Baldwins Crescent

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/M2/day)	Current	5	2	7	12	0	1	2	4	0
	Previous	8	4	10	12	1	5	3	3	0

Figure 2

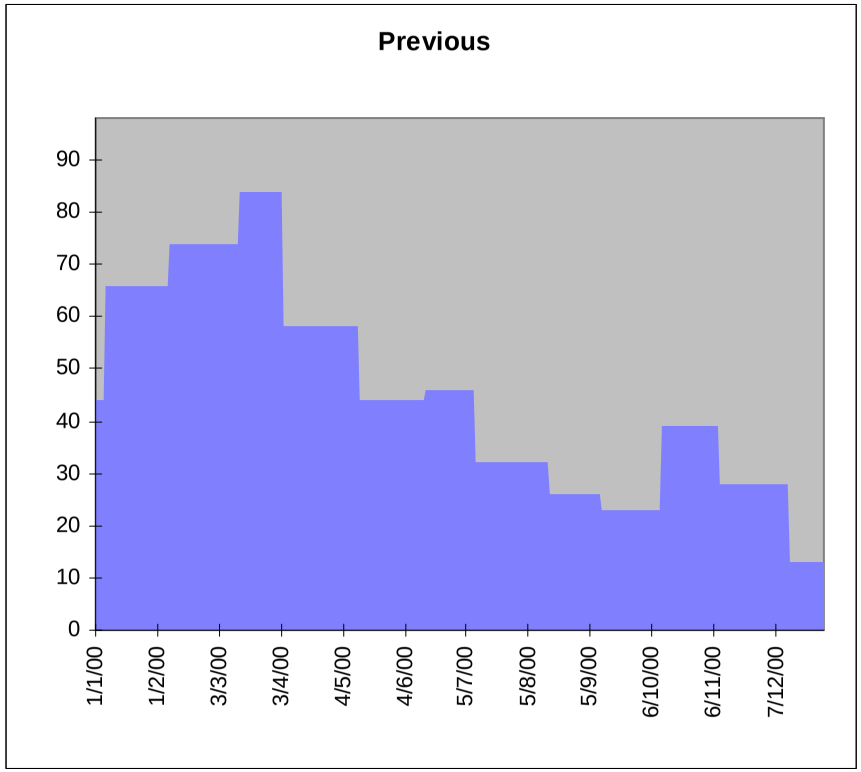
Deposit Gauge Analysis Report

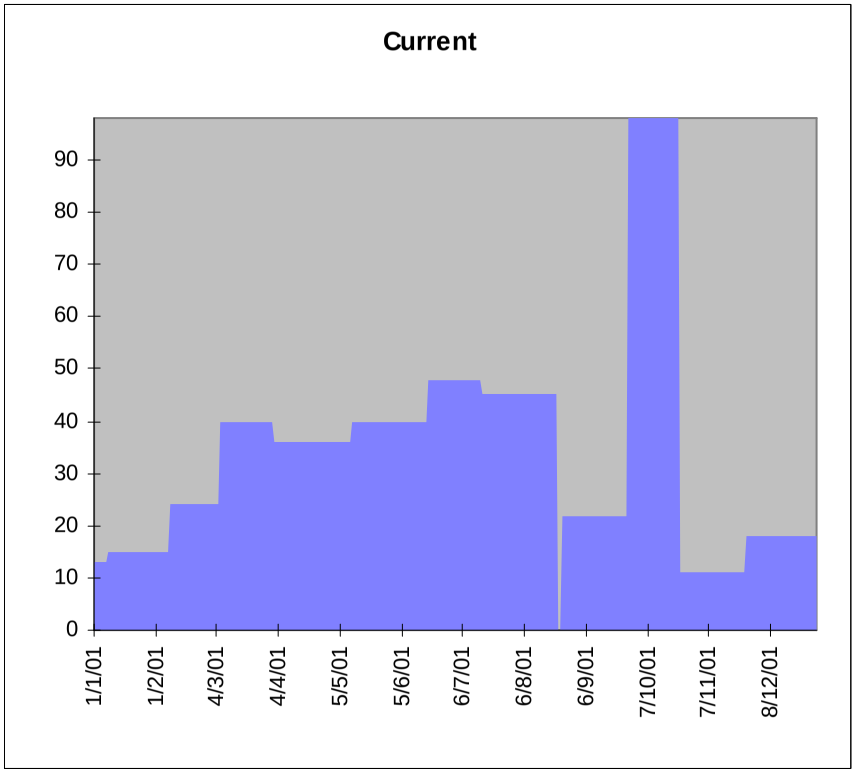
Jeremy's Oil Distributors, Baldwins Crescent

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	35	98	11	99.5	0	0
Previous	45	84	12	100.0	0	0
Change	-10	Decrease -22%				

Figure 3

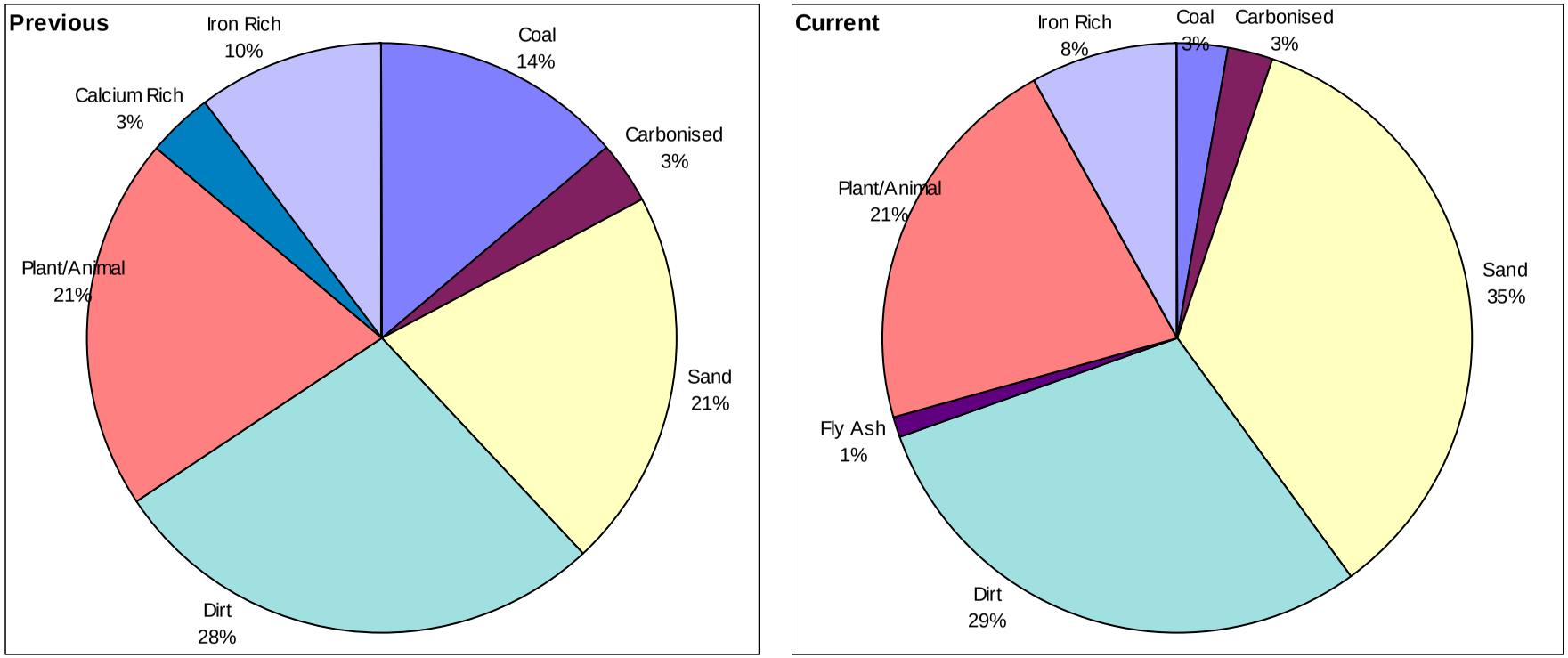
Deposit Gauge Analysis Report

Cil Carne Farm, Port Talbot

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00



Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/M2/day)	Current	2	2	26	22	1	16	0	6	0
	Previous	4	1	6	8	0	6	1	3	0

Figure 4

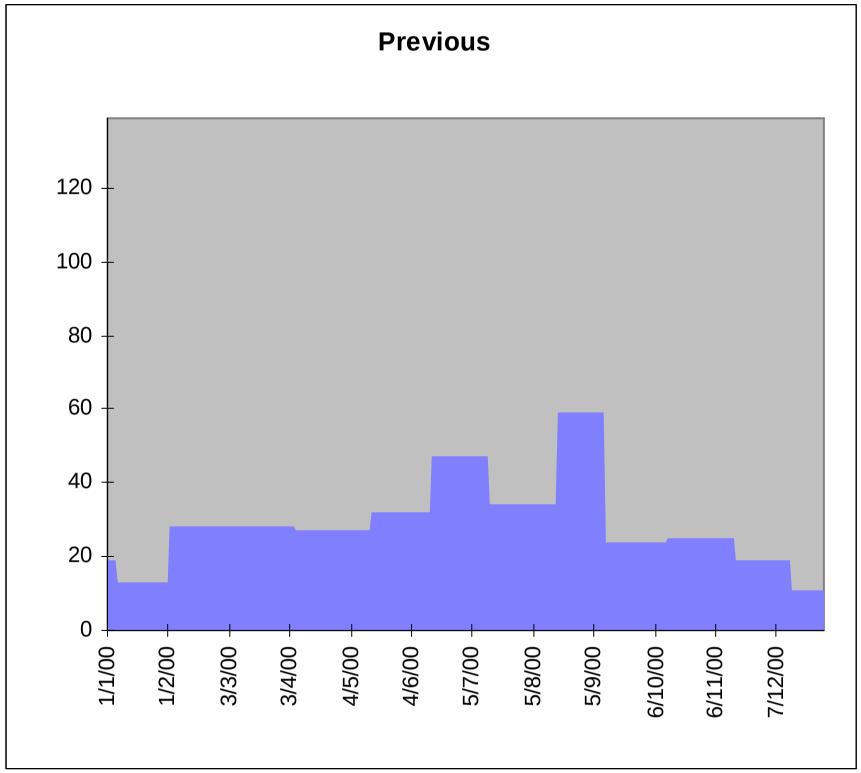
Deposit Gauge Analysis Report

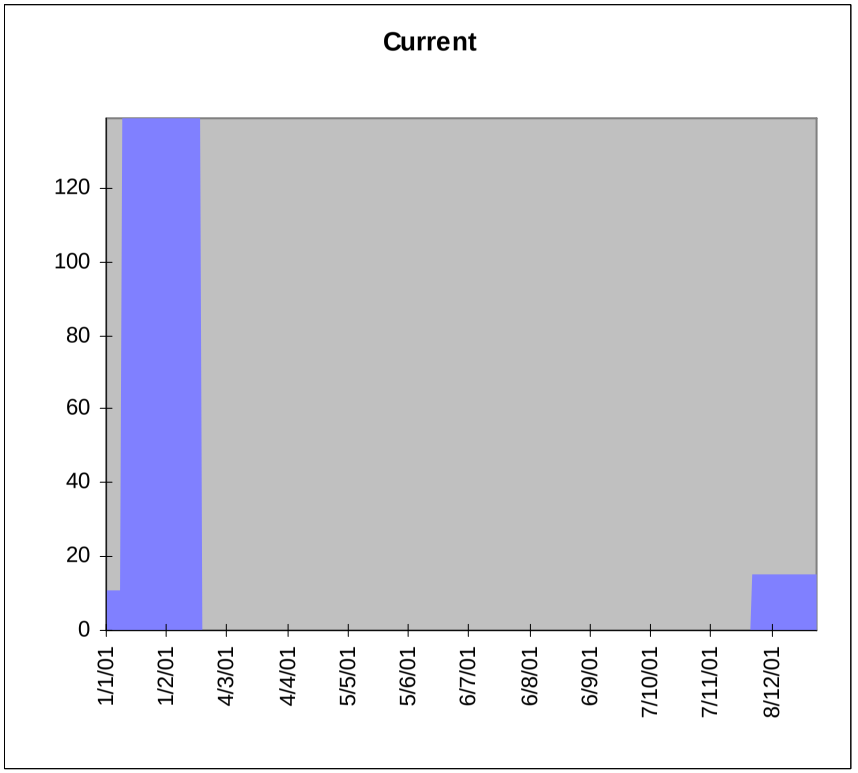
Cil Carne Farm, Port Talbot

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	76	139	2	22.5	0	0
Previous	29	59	12	100.0	0	0
Change	47	Increase 162%				

Figure 5

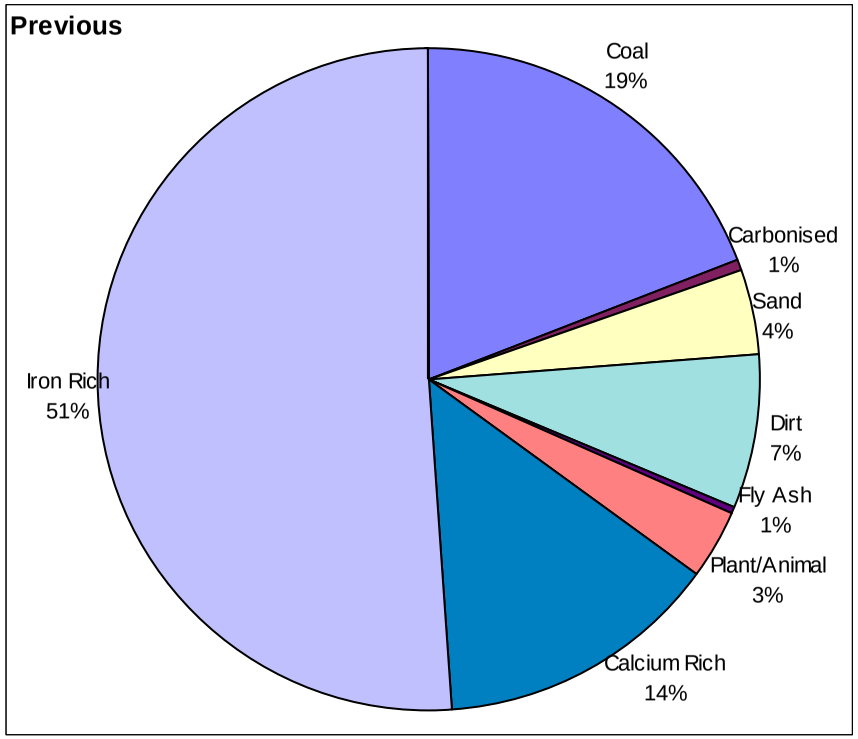
Deposit Gauge Analysis Report

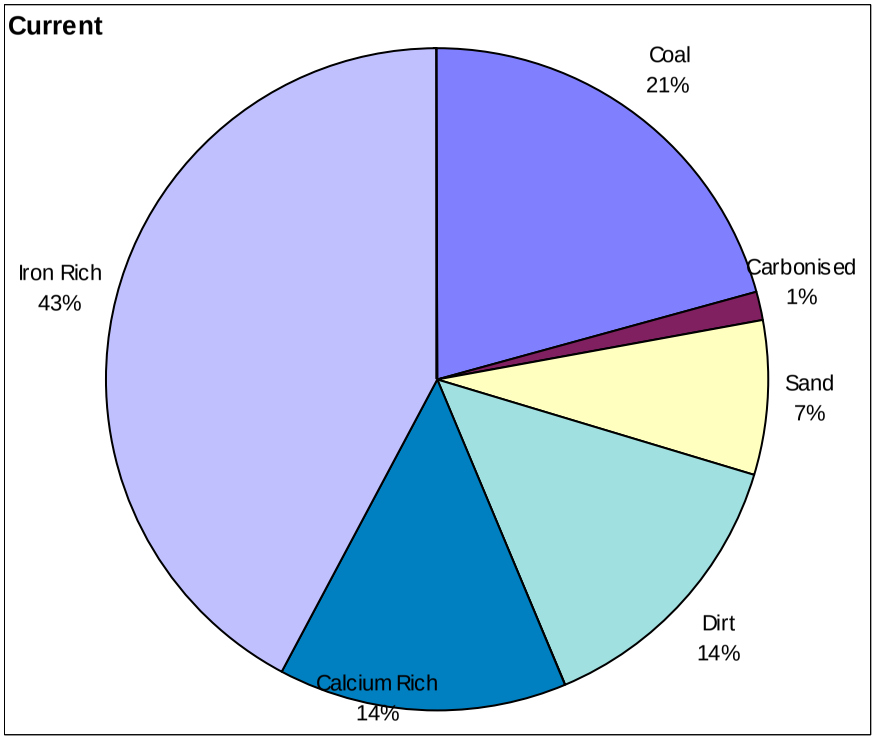
24, Prince Street, Port Talbot

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/m2/day)	Current	28	2	10	19	0	0	19	57	0
	Previous	37	1	8	14	1	6	27	98	0

Figure 6

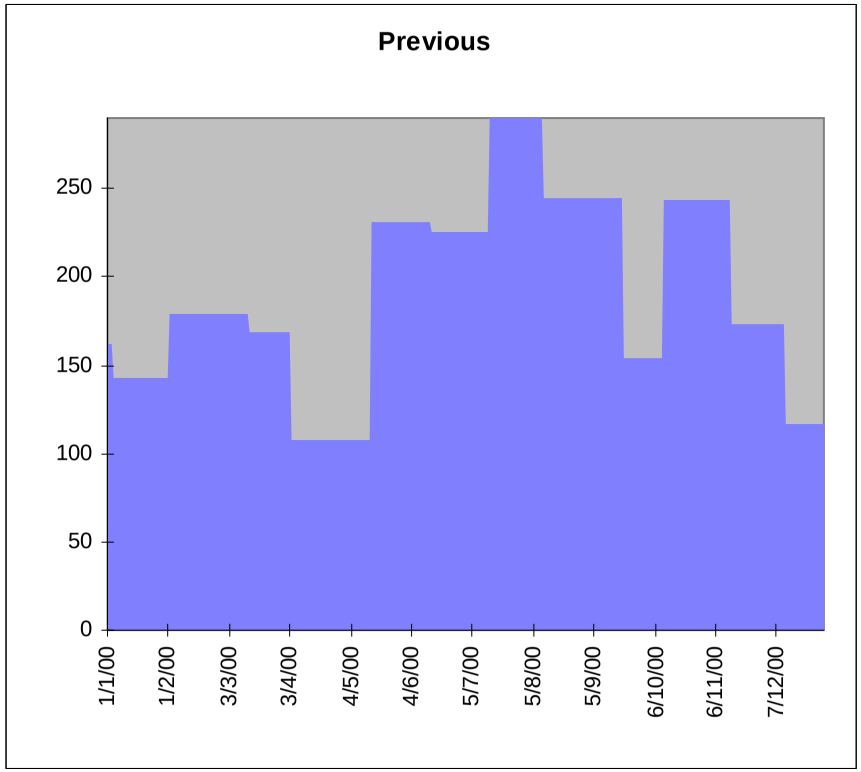
Deposit Gauge Analysis Report

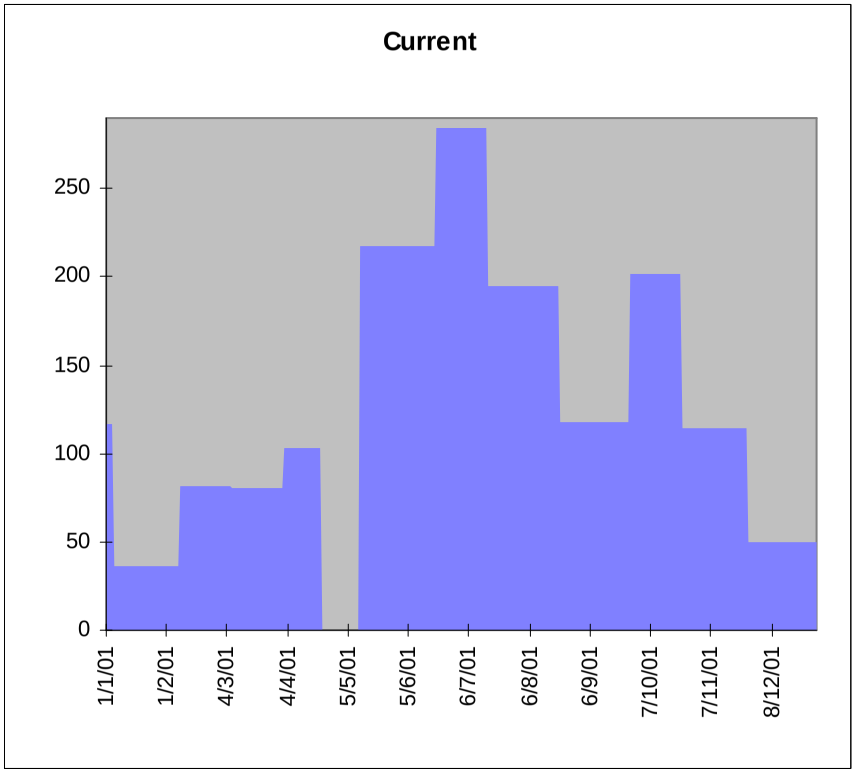
24, Prince Street, Port Talbot

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	135	284	11	94.8	37	92
Previous	192	290	12	100.0	0	163
Change	-57	Decrease -30%				

Figure 7

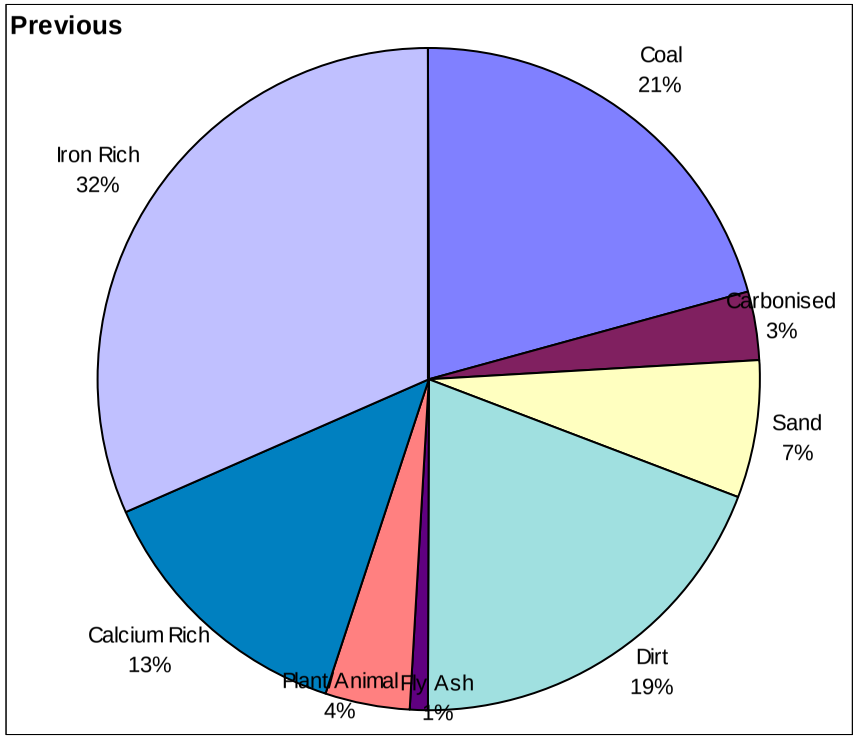
Deposit Gauge Analysis Report

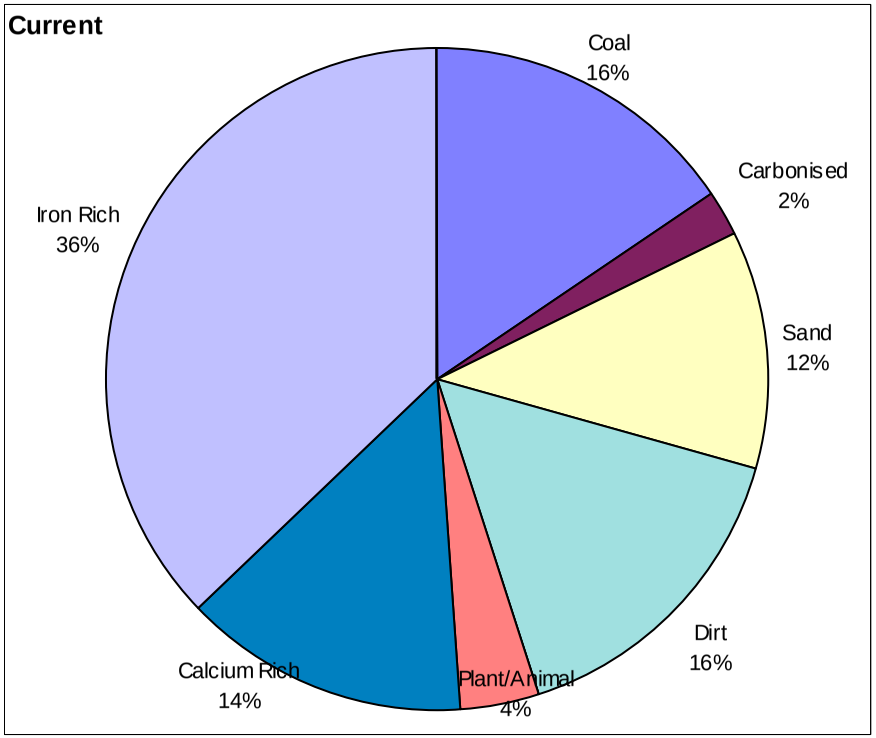
Ffrwdwyllt House, Margam Road, Port Talbot

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/m2/day)	Current	8	1	6	8	0	2	7	19	0
	Previous	25	4	8	23	1	5	16	38	0

Figure 8

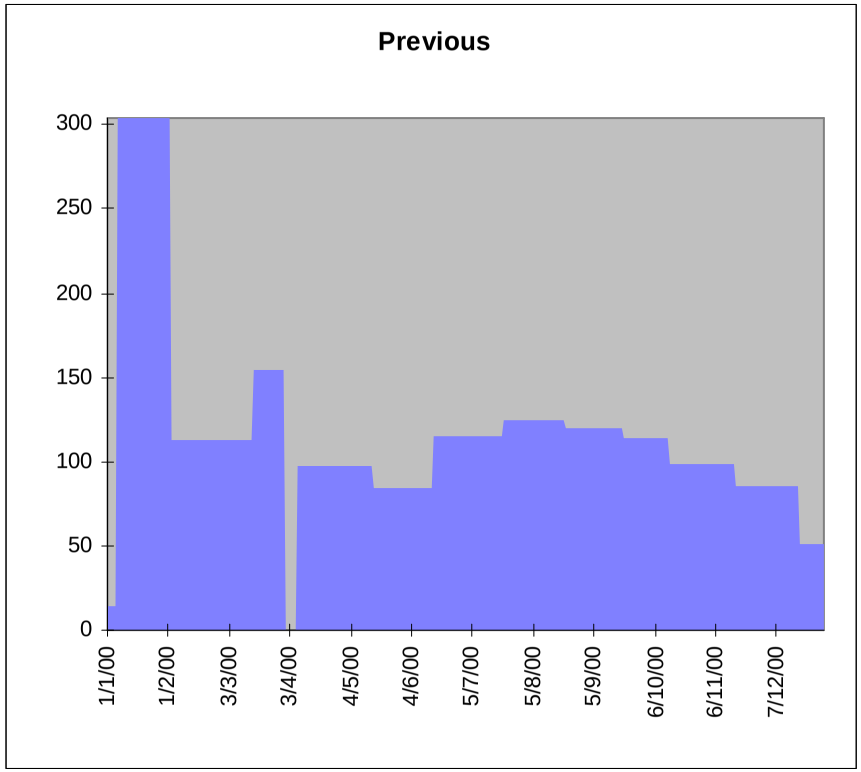
Deposit Gauge Analysis Report

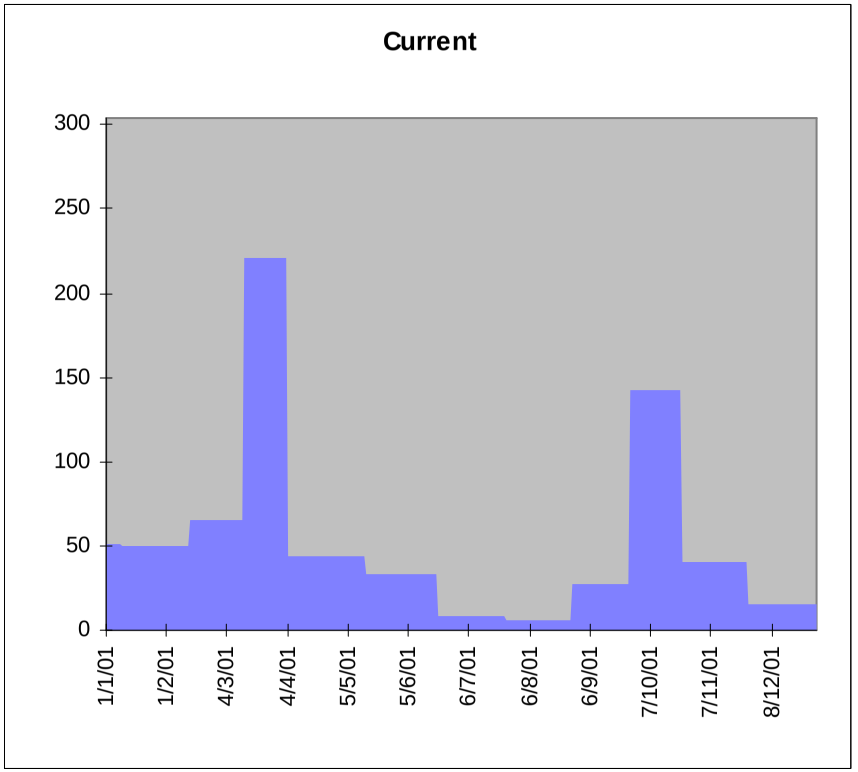
Ffrwdwyllt House, Margam Road, Port Talbot

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	51	221	11	100.0	0	22
Previous	120	304	12	98.3	0	28
Change	-69	Decrease -58%				

Figure 9

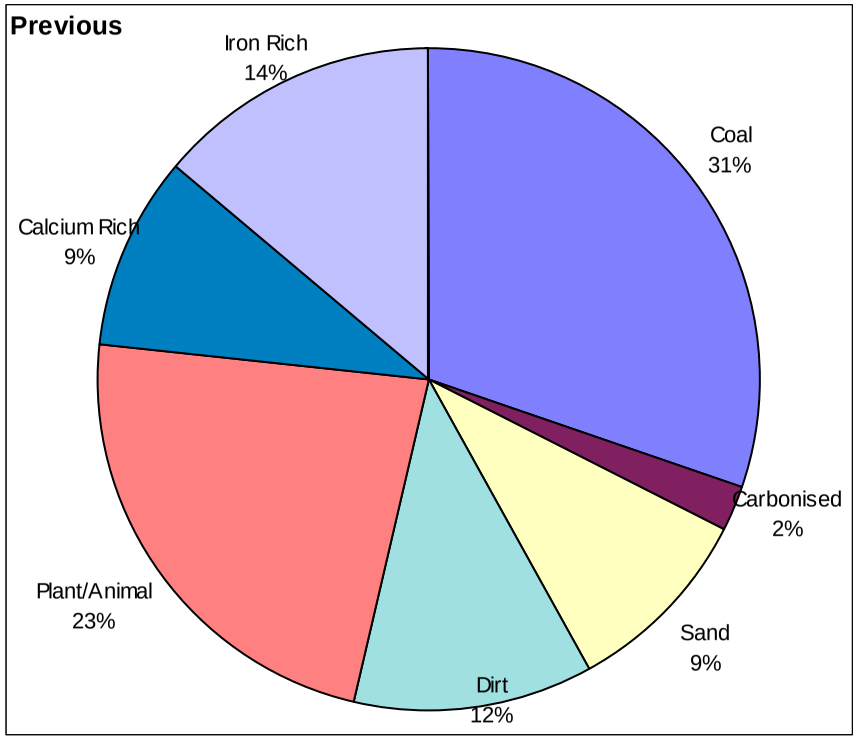
Deposit Gauge Analysis Report

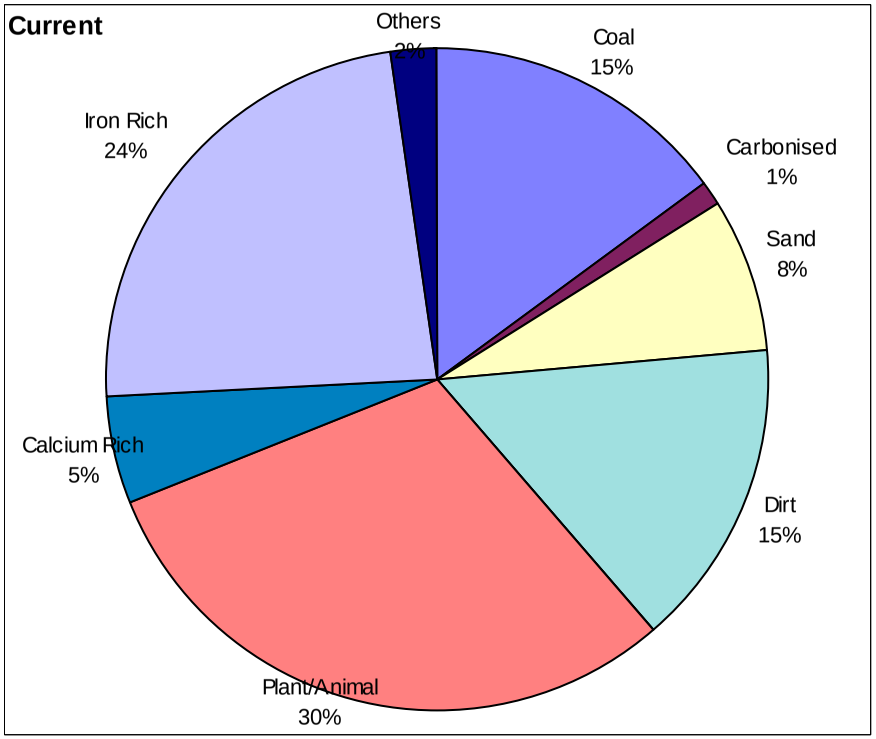
Eglwys Nunydd Resevoir, Port Talbot

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/m2/day)	Current	14	1	7	14	0	28	5	22	2
	Previous	13	1	4	5	0	10	4	6	0

Figure 10

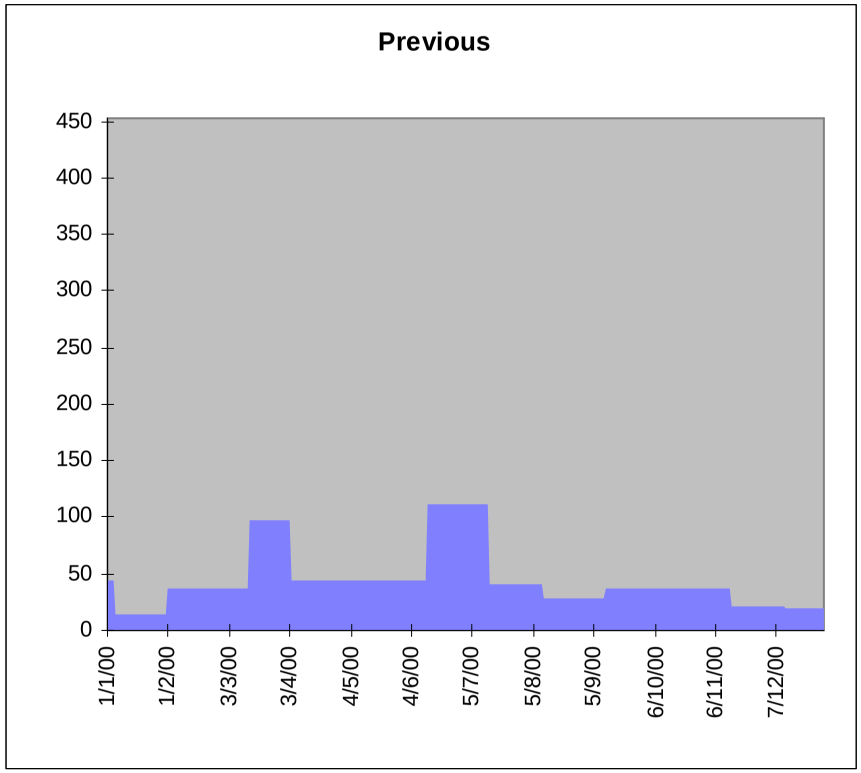
Deposit Gauge Analysis Report

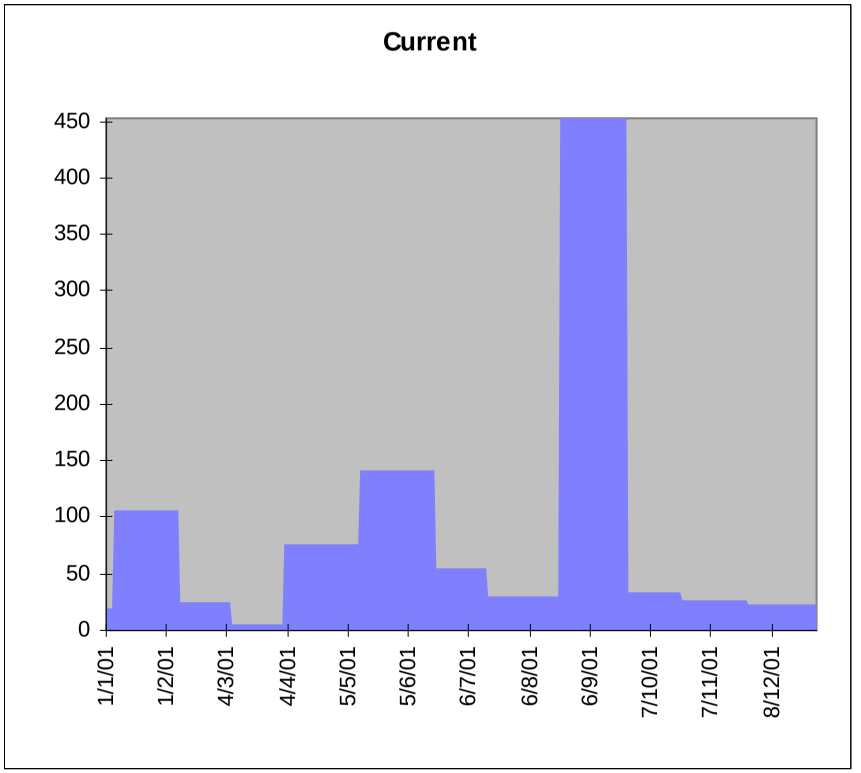
Eglwys Nunydd Resevoir, Port Talbot

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	93	453	11	100.0	0	35
Previous	44	111	12	100.0	0	0
Change	49	Increase 111%				

Figure 11

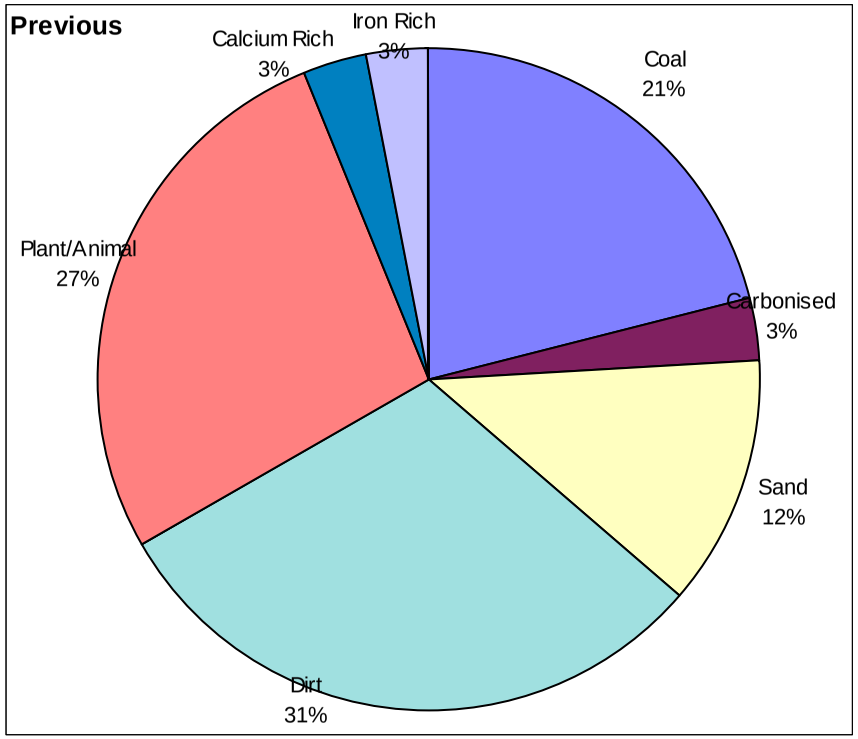
Deposit Gauge Analysis Report

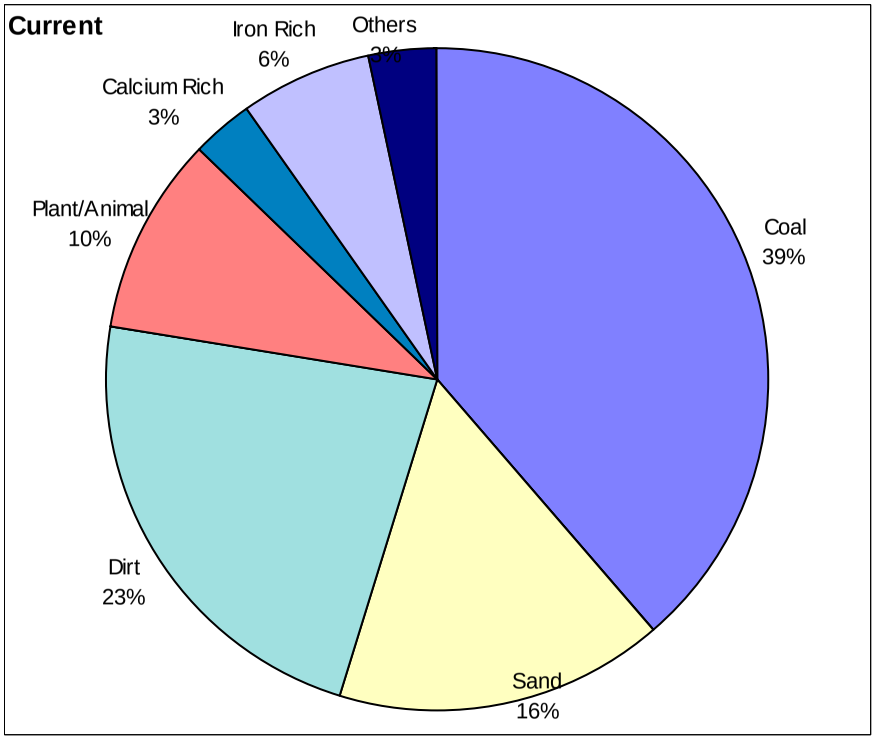
Primary School, Gwaen Cae Gurwen

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/m2/day)	Current	12	0	5	7	0	3	1	2	1
	Previous	7	1	4	10	0	9	1	1	0

Figure 12

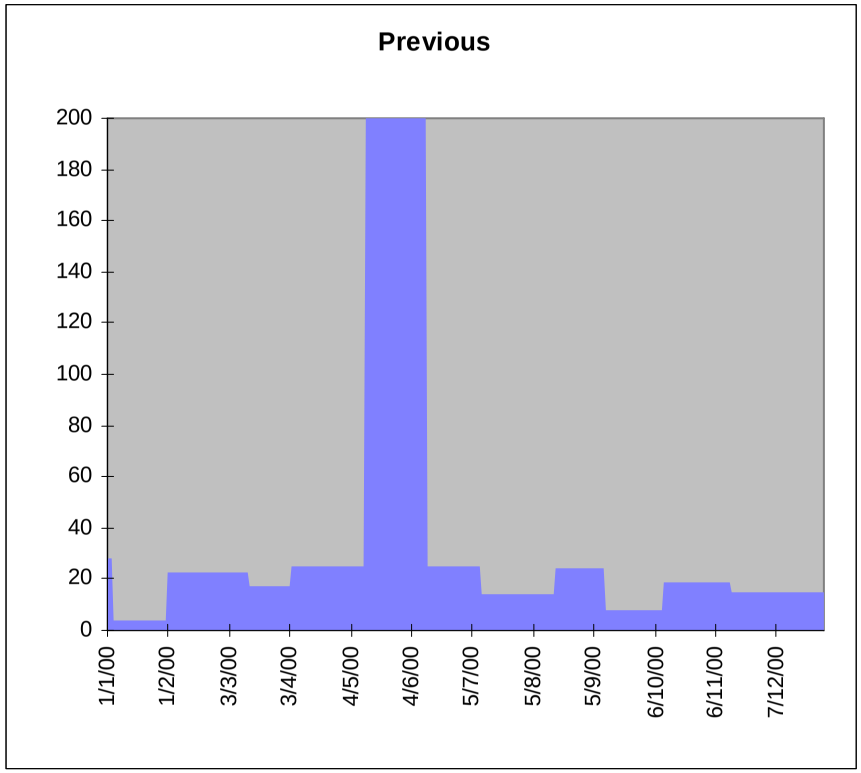
Deposit Gauge Analysis Report

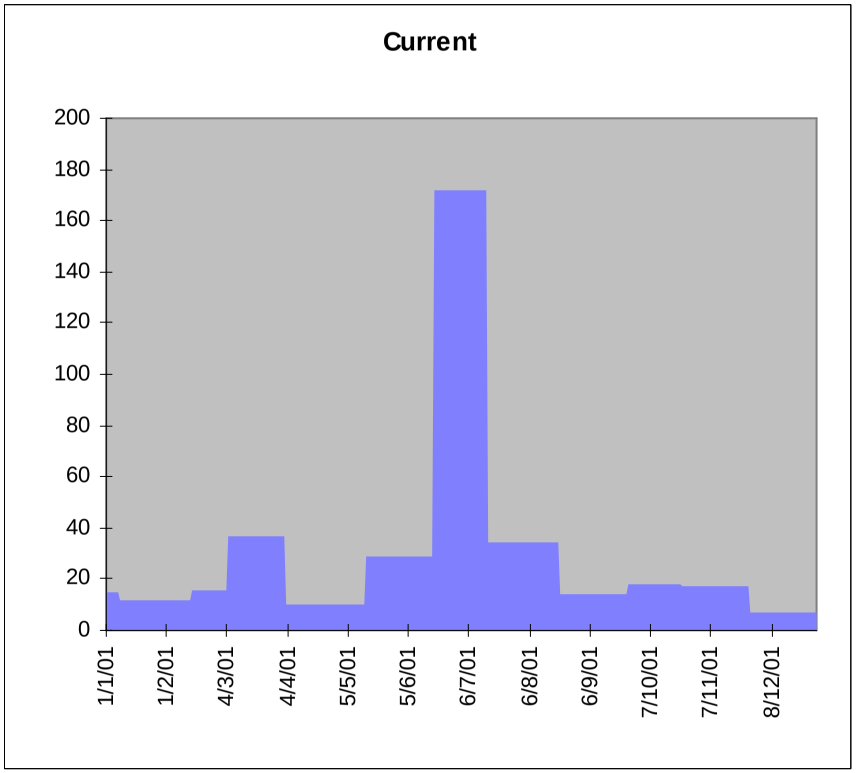
Primary School, Gwaen Cae Gurwen

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	31	172	11	100.0	0	0
Previous	33	200	12	100.0	0	31
Change	-2	Decrease -6%				

Figure 13

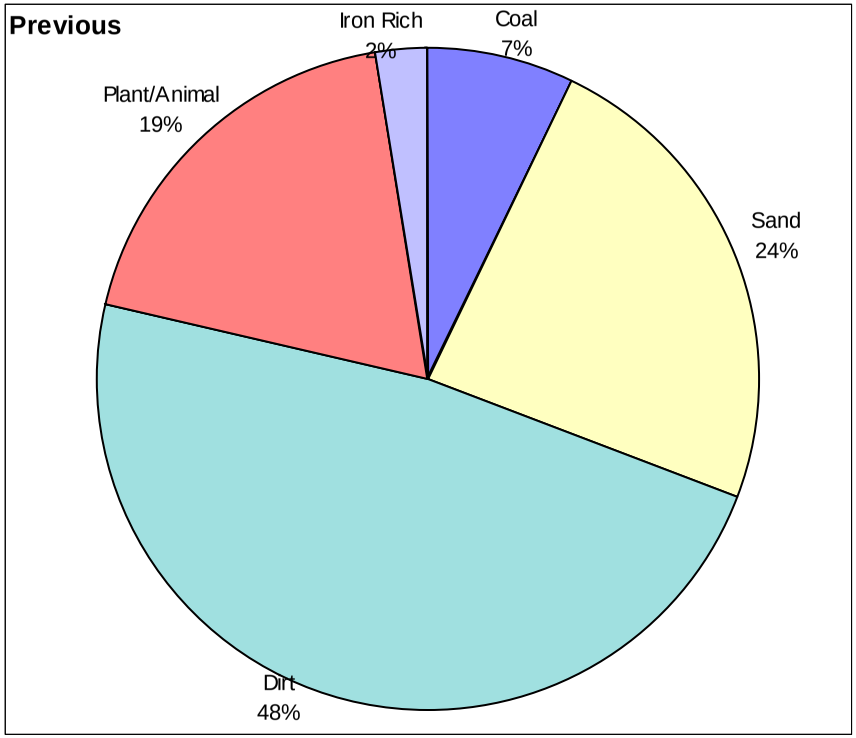
Deposit Gauge Analysis Report

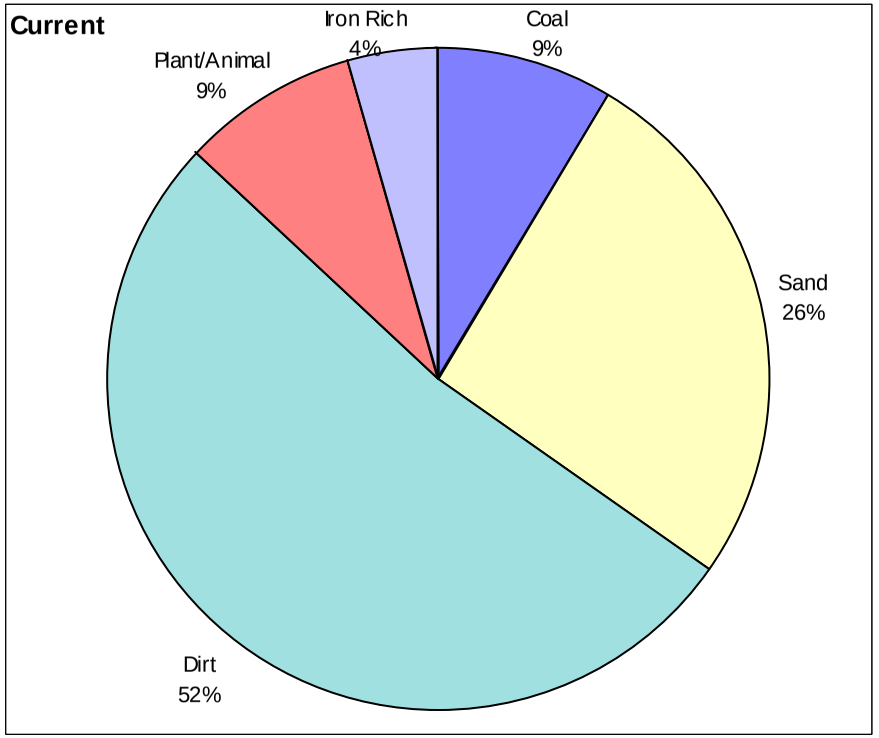
Cwmllynfell

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/m2/day)	Current	2	0	6	12	0	2	0	1	0
	Previous	3	0	10	20	0	8	0	1	0

Figure 14

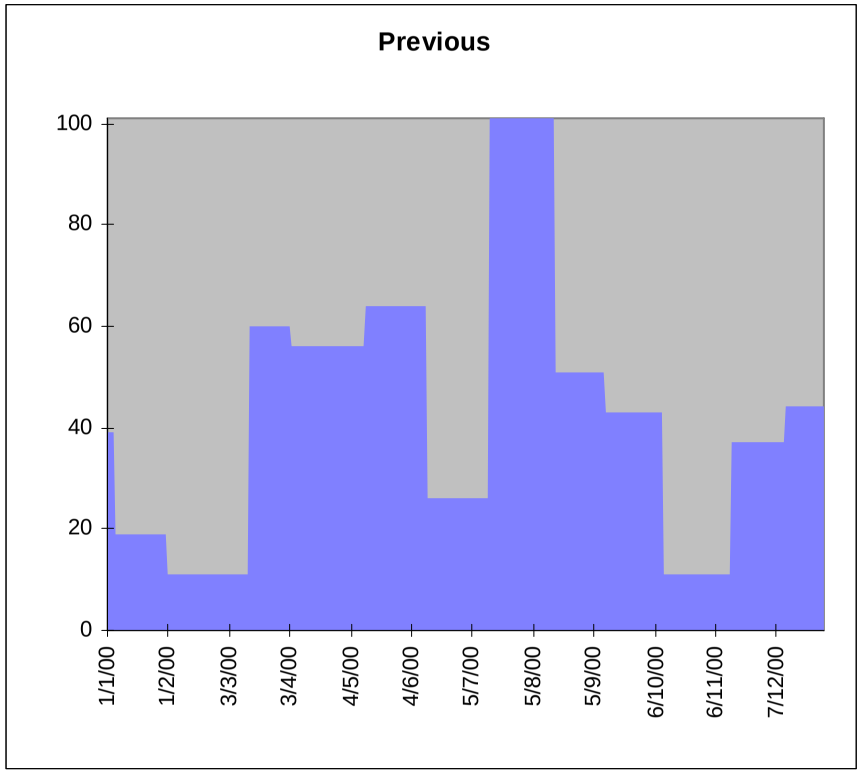
Deposit Gauge Analysis Report

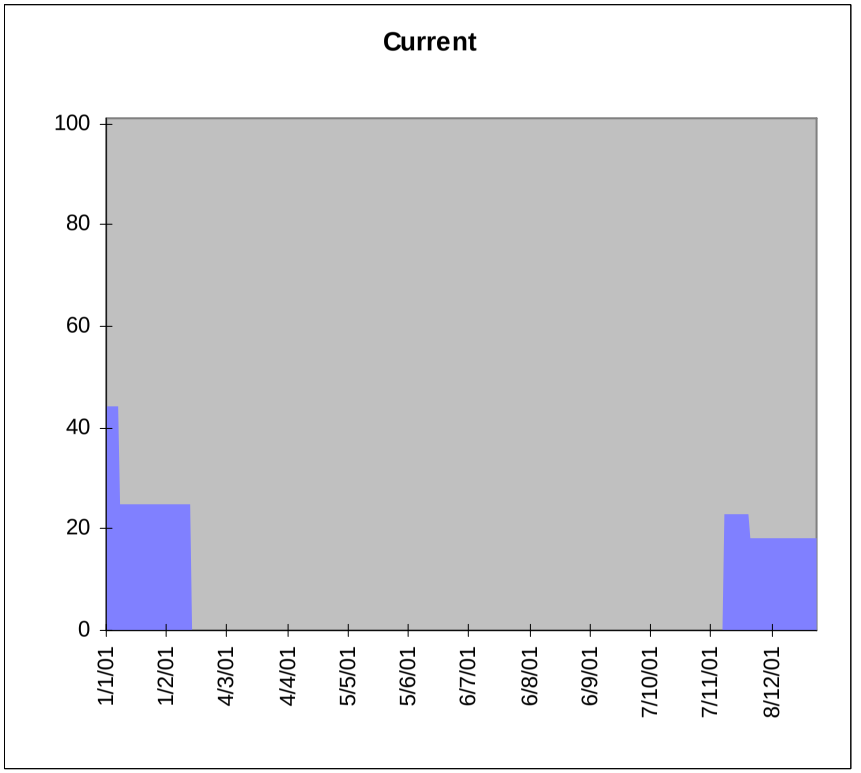
Cwmllynfell

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	24	44	3	25.0	0	0
Previous	43	101	12	100.0	0	0
Change	-19	Decrease -44%				

Figure 15

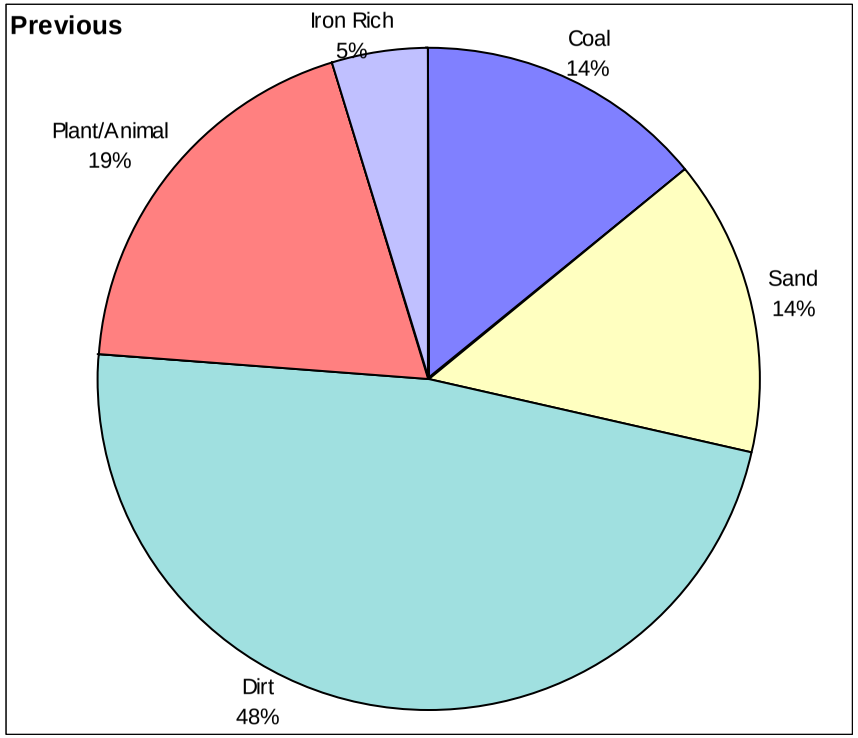
Deposit Gauge Analysis Report

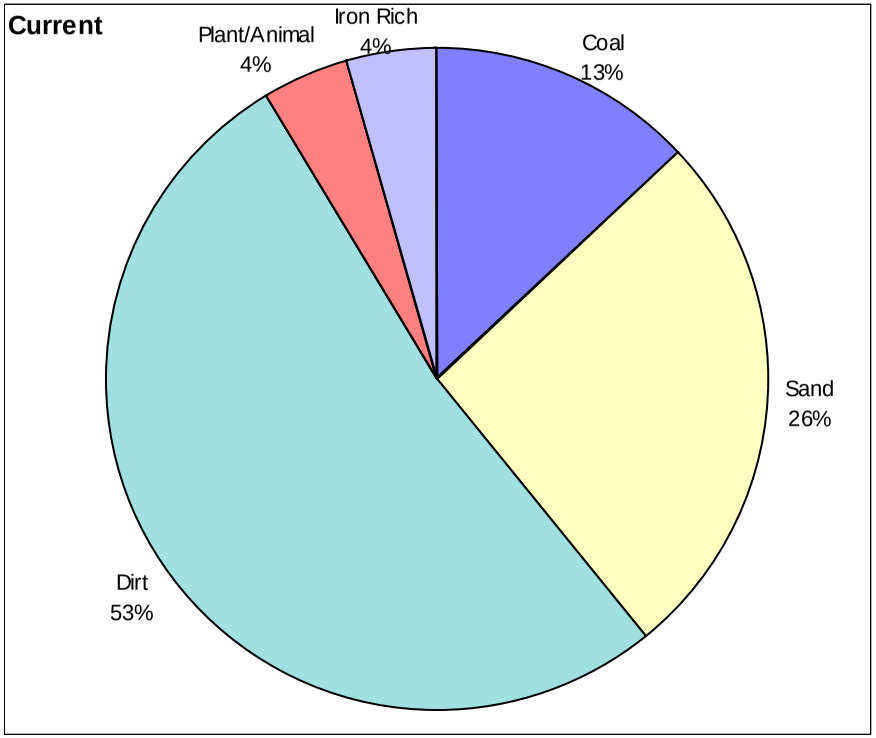
Workingmens Club, Tairgwaith

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/m2/day)	Current	3	0	6	12	0	1	0	1	0
	Previous	3	0	3	10	0	4	0	1	0

Figure 16

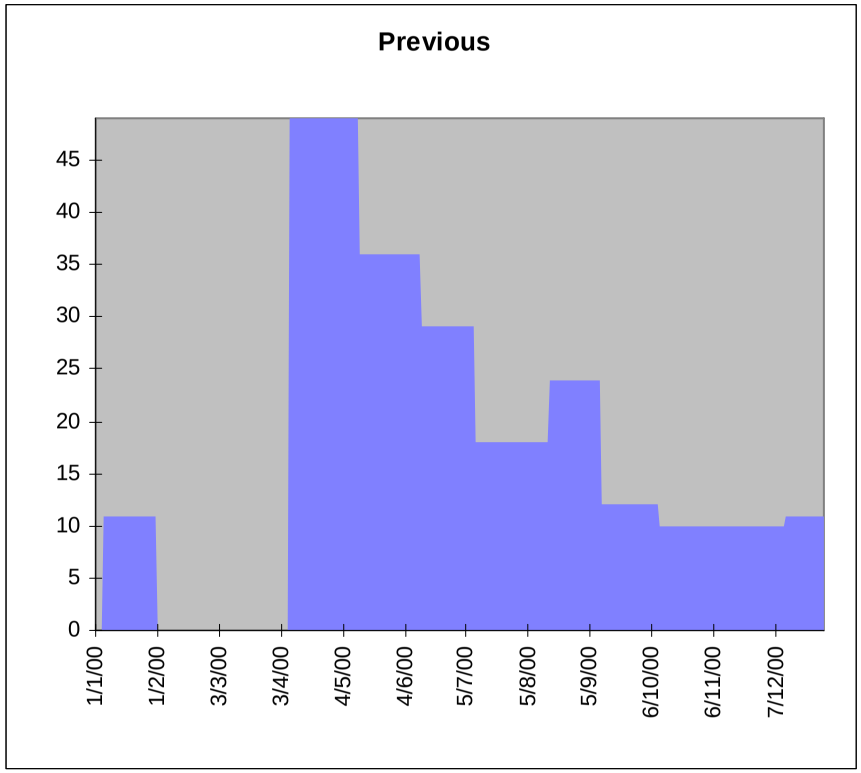
Deposit Gauge Analysis Report

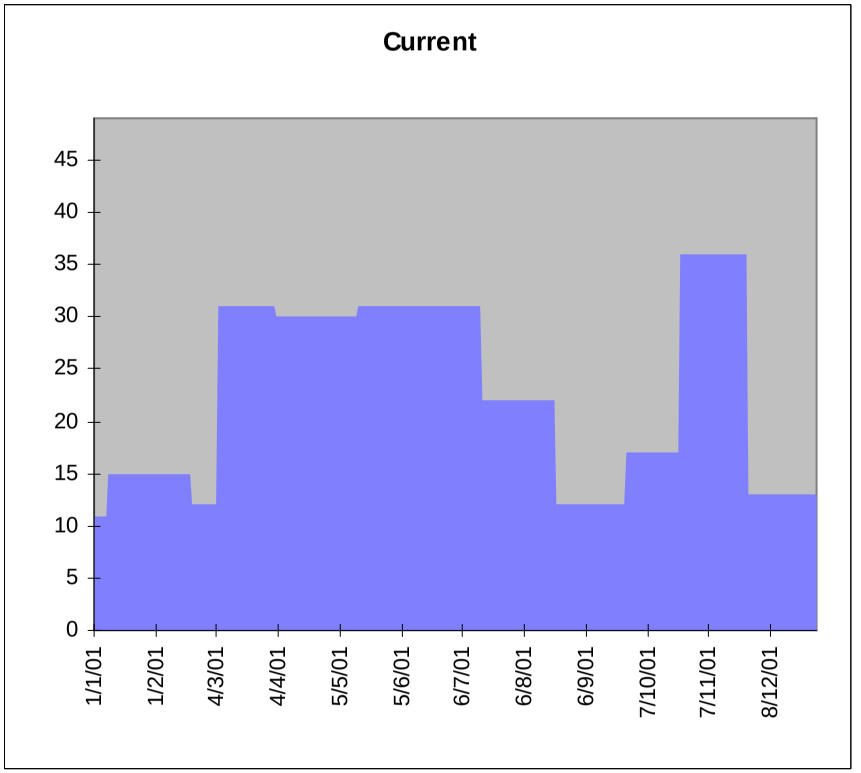
Workingmens Club, Tairgwaith

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum		Capture	Days within 10% of	Days Exceeding
Current	23	36	11	100.0	0	0
Previous	22	49	10	81.6	0	0
Change	1	Increase 5%				

Figure 17

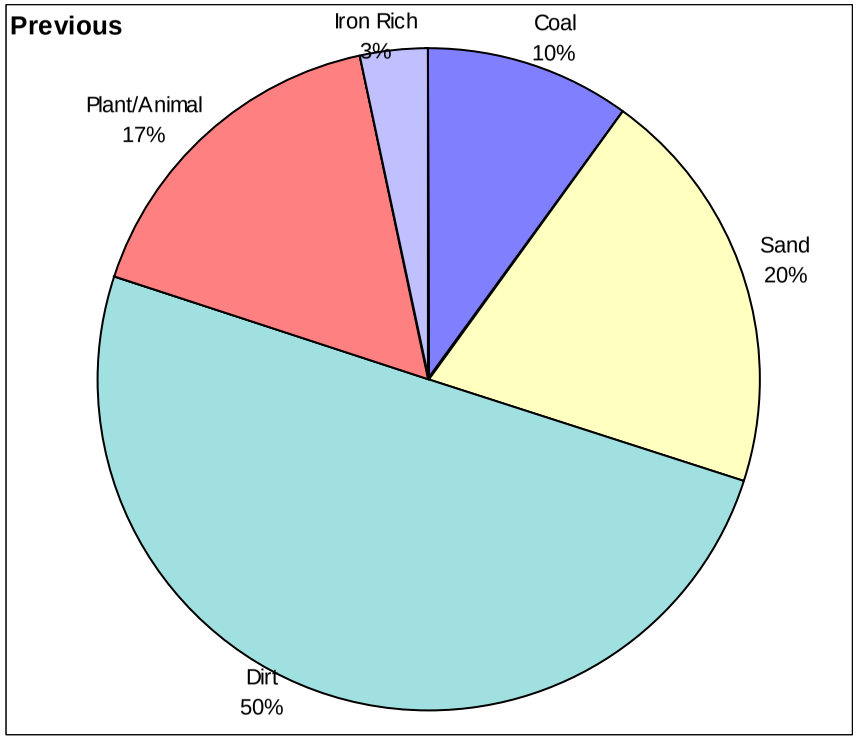
Deposit Gauge Analysis Report

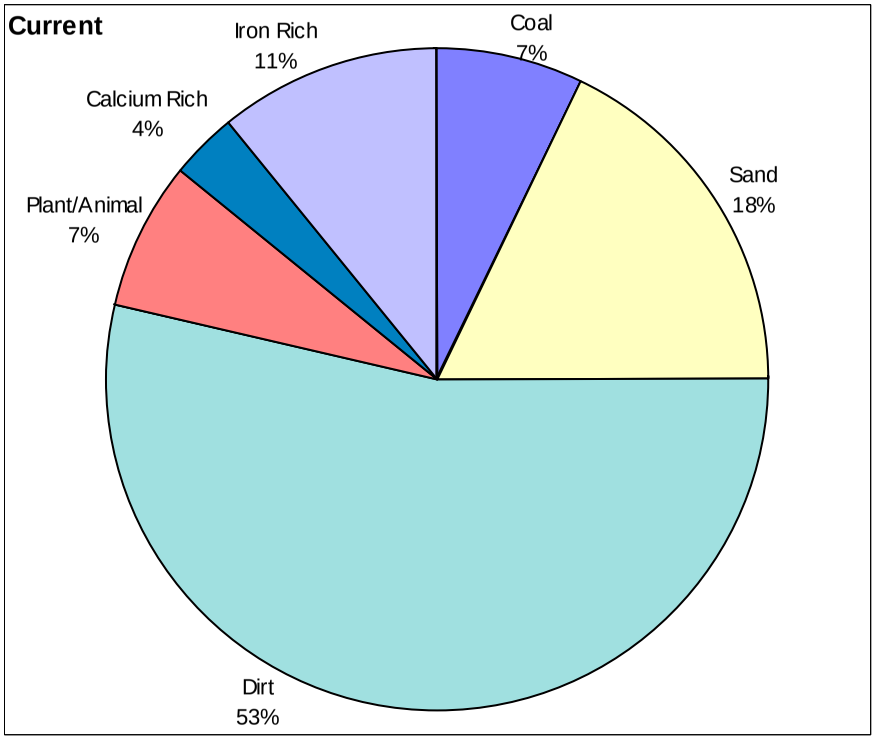
41, Parish Road, Cwmgwrach

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/m2/day)	Current	2	0	5	15	0	2	1	3	0
	Previous	3	0	6	15	0	5	0	1	0

Figure 18

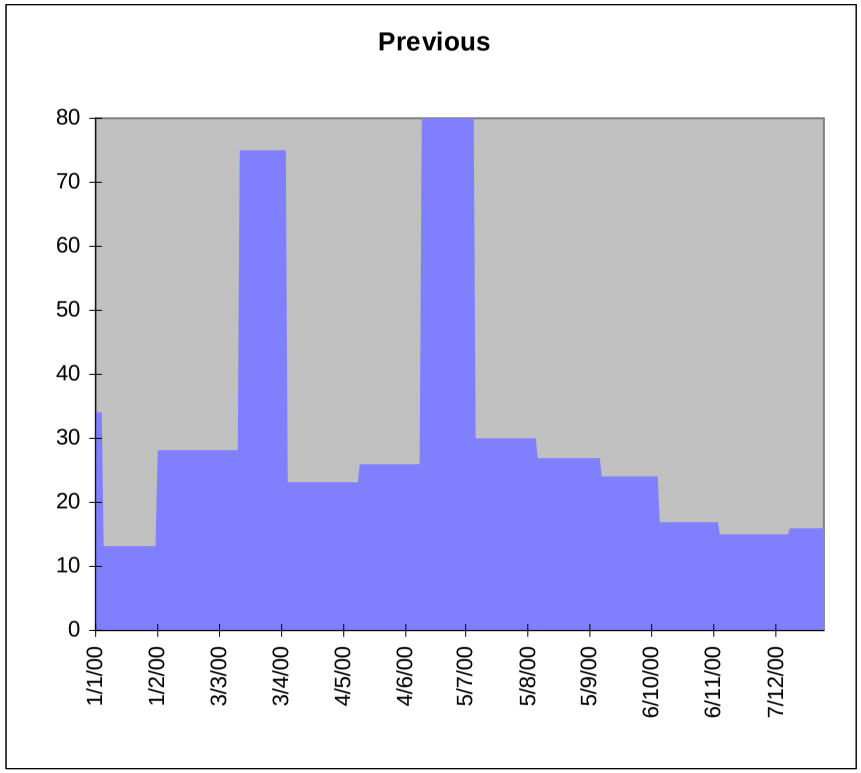
Deposit Gauge Analysis Report

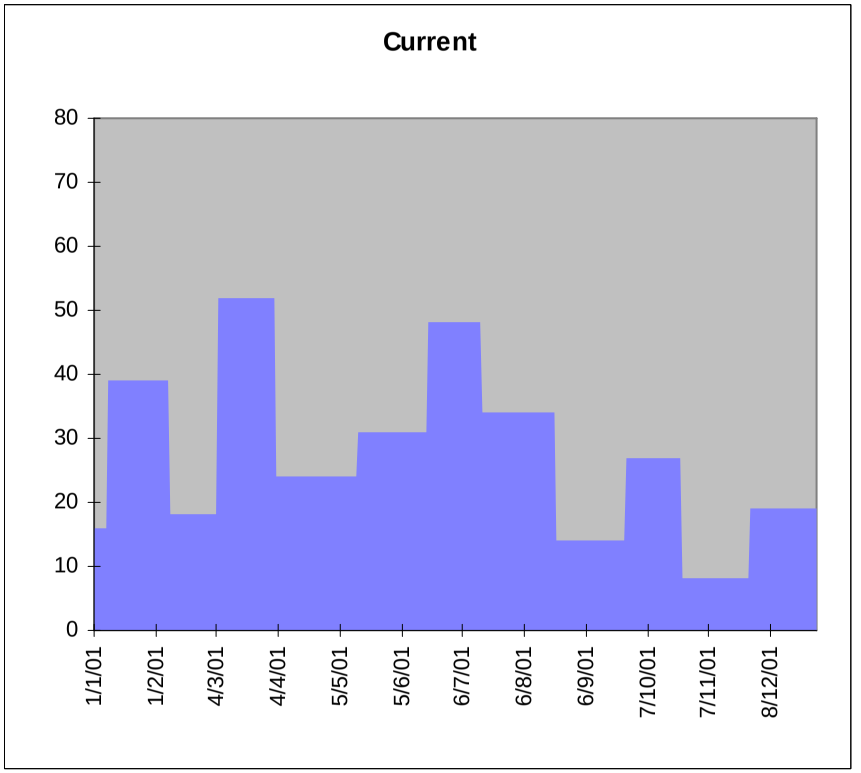
41, Parish Road, Cwmgwrach

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	28	52	11	100.0	0	0
Previous	30	80	12	100.0	0	0
Change	-2	Decrease -7%				

Figure 19

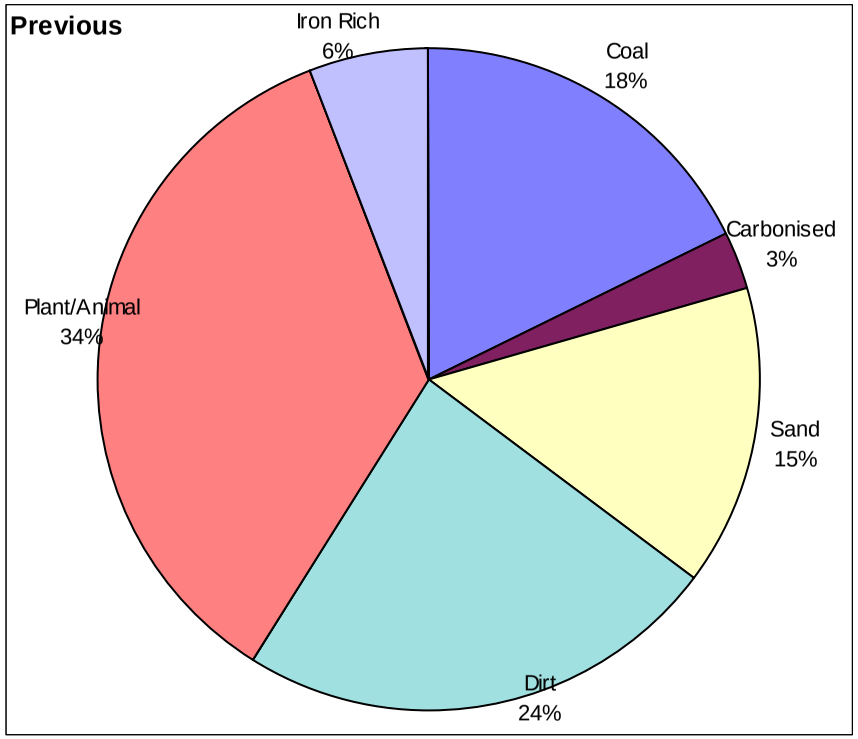
Deposit Gauge Analysis Report

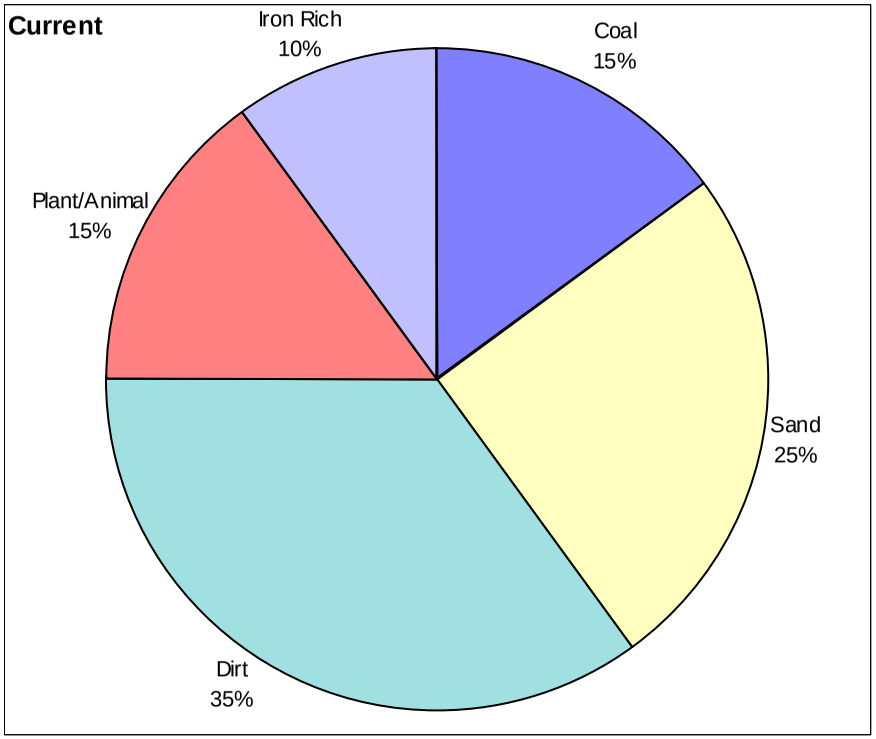
2, Llygad Yr Haul, Glynneath

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/m2/day)	Current	3	0	5	7	0	3	0	2	0
	Previous	6	1	5	8	0	12	0	2	0

Figure 20

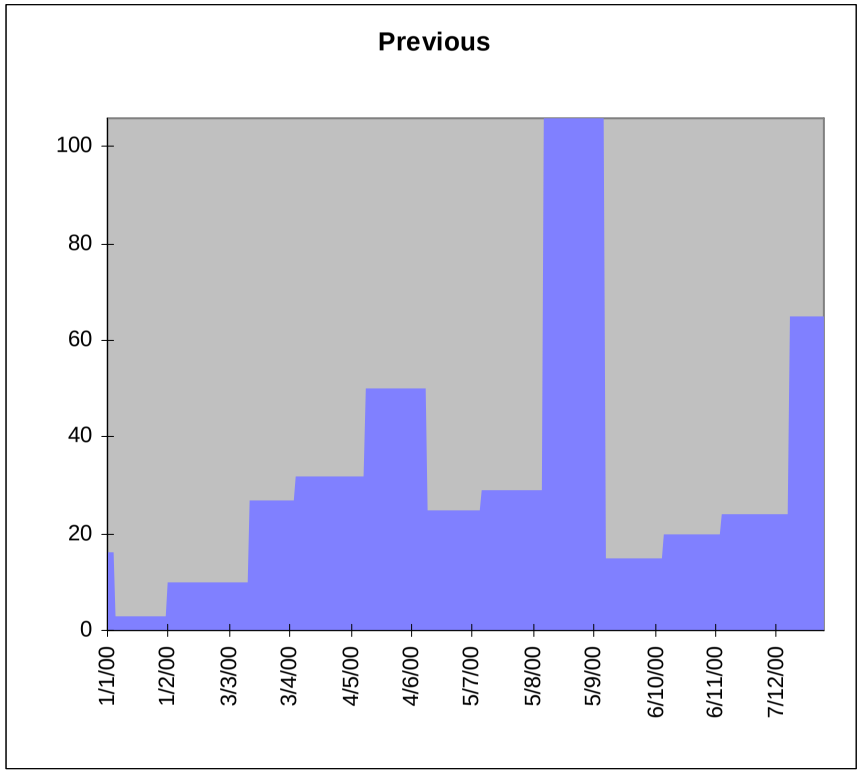
Deposit Gauge Analysis Report

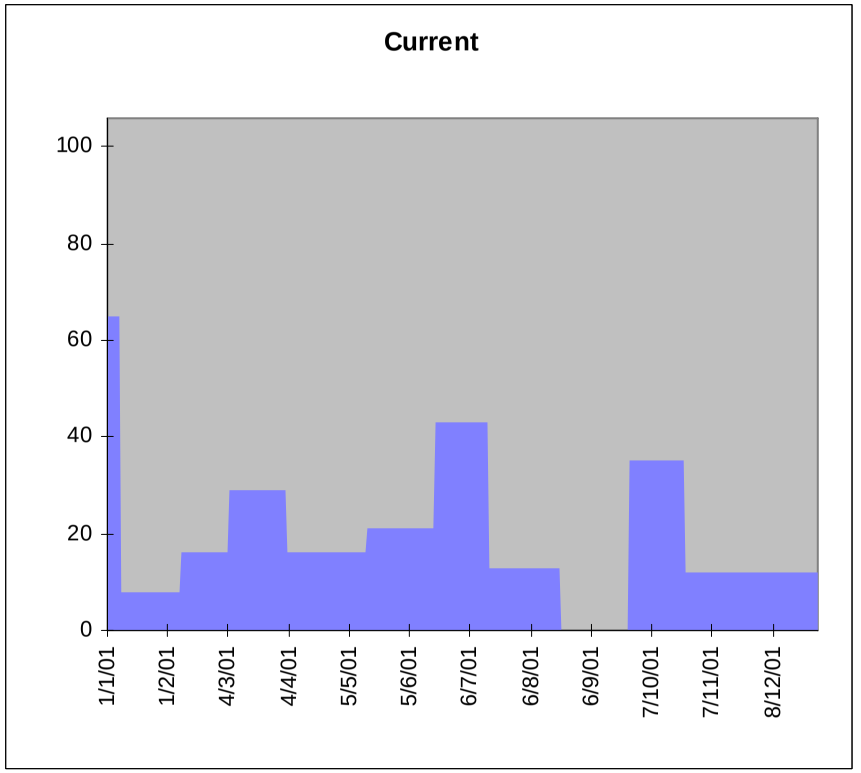
2, Llygad Yr Haul, Glynneath

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-00

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	21	65	10	90.4	0	0
Previous	33	106	12	100.0	0	0
Change	-12	Decrease -36%				

Figure 21

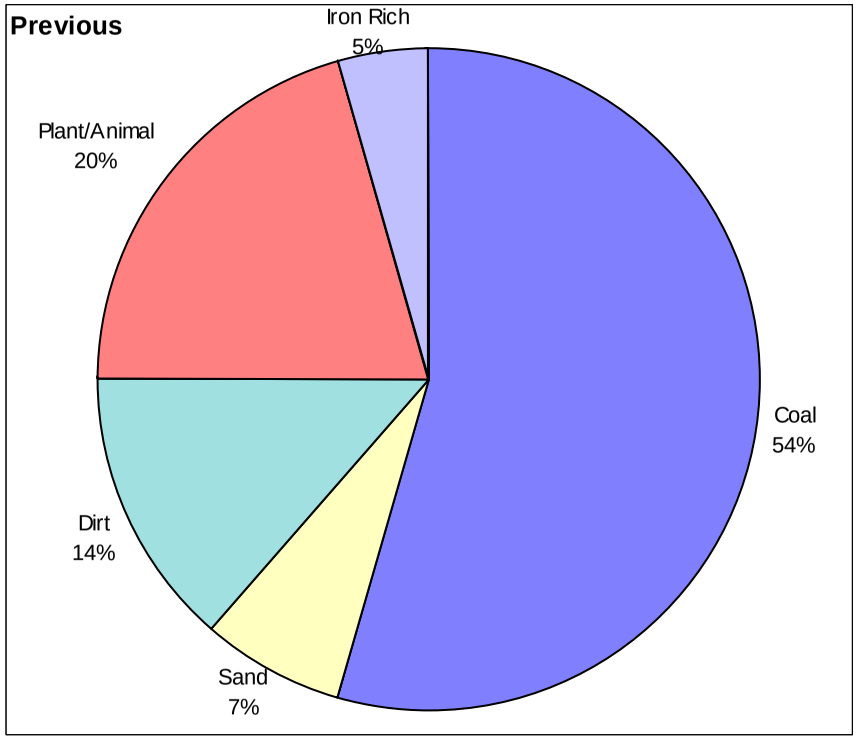
Deposit Gauge Analysis Report

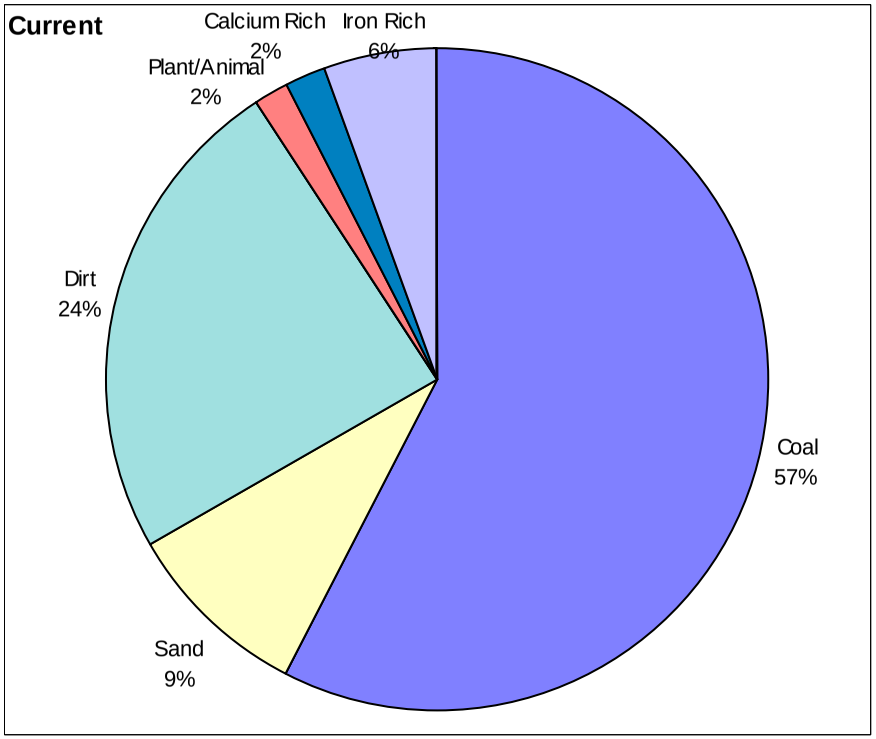
11, Wembley Avenue, Onllwyn

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/m2/day)	Current	31	0	5	13	0	1	1	3	0
	Previous	24	0	3	6	0	9	0	2	0

Figure 22

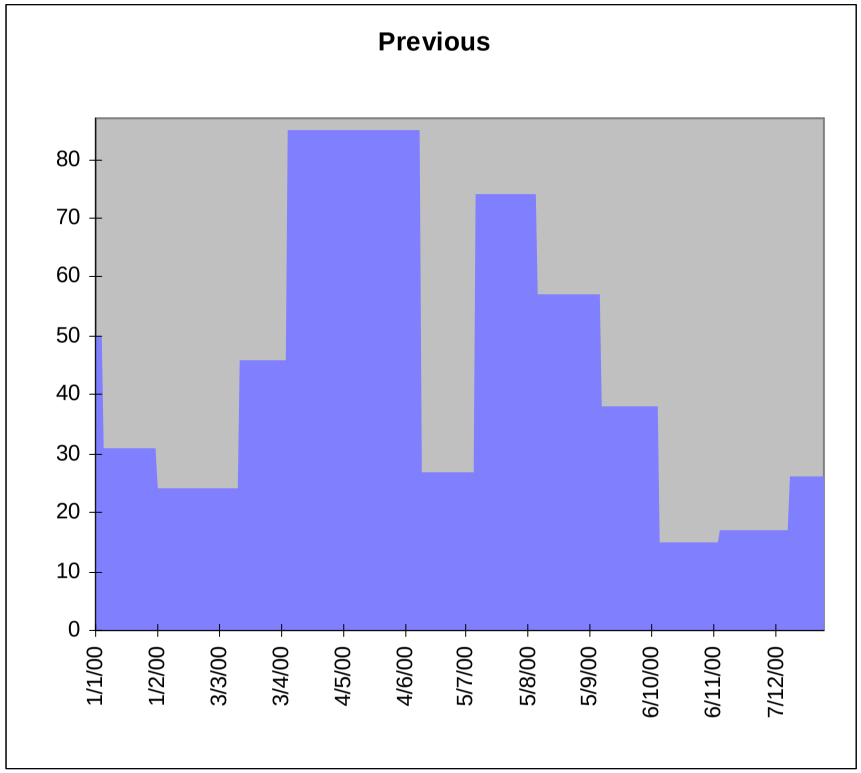
Deposit Gauge Analysis Report

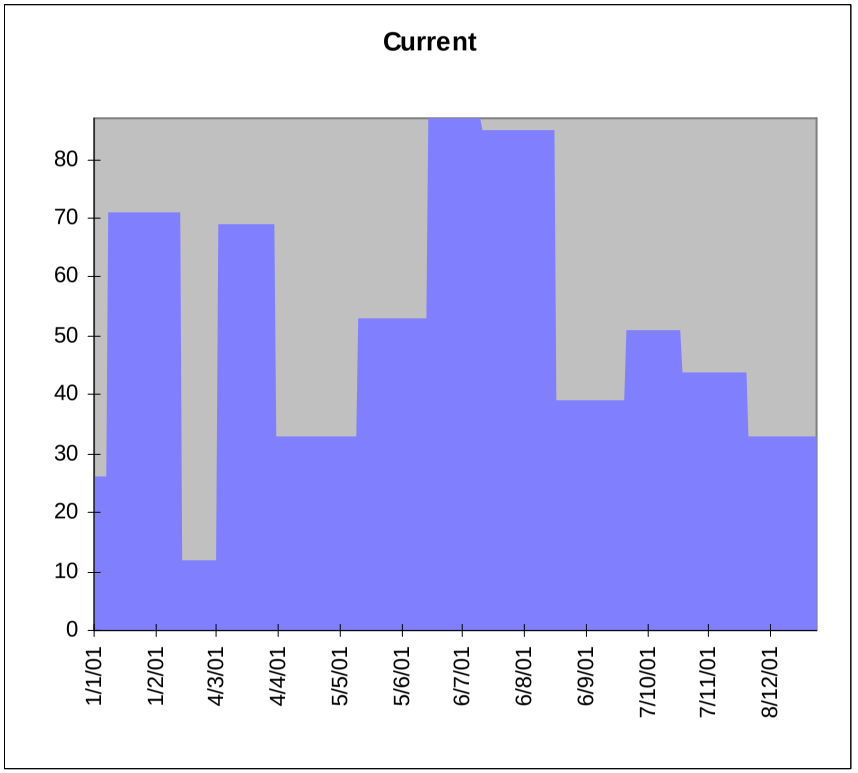
11, Wembley Avenue, Onllwyn

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	53	87	11	100.0	0	0
Previous	45	85	12	100.0	0	0
Change	8	Increase 18%				

Figure 23

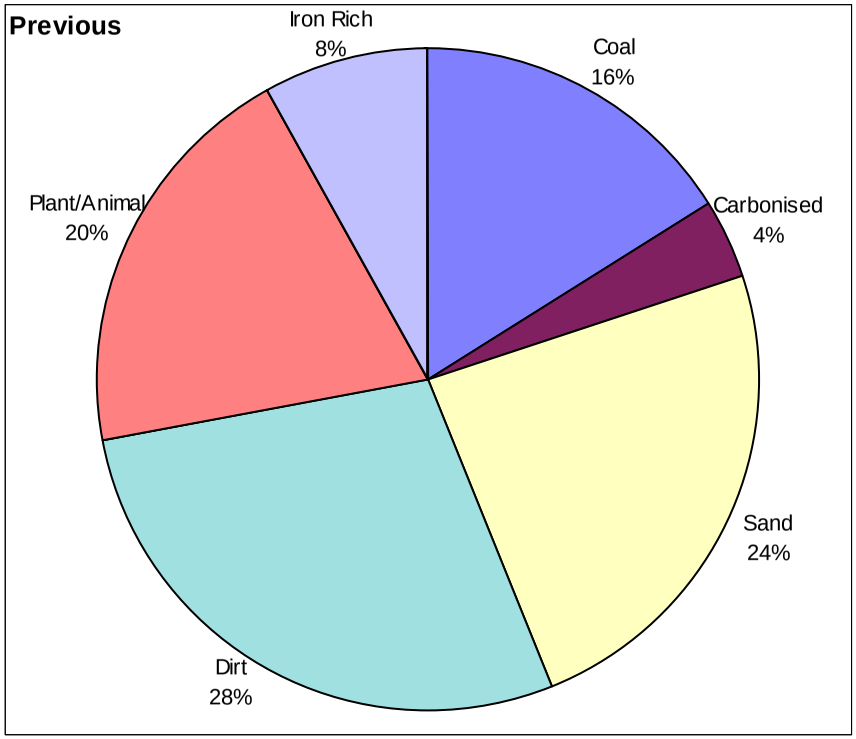
Deposit Gauge Analysis Report

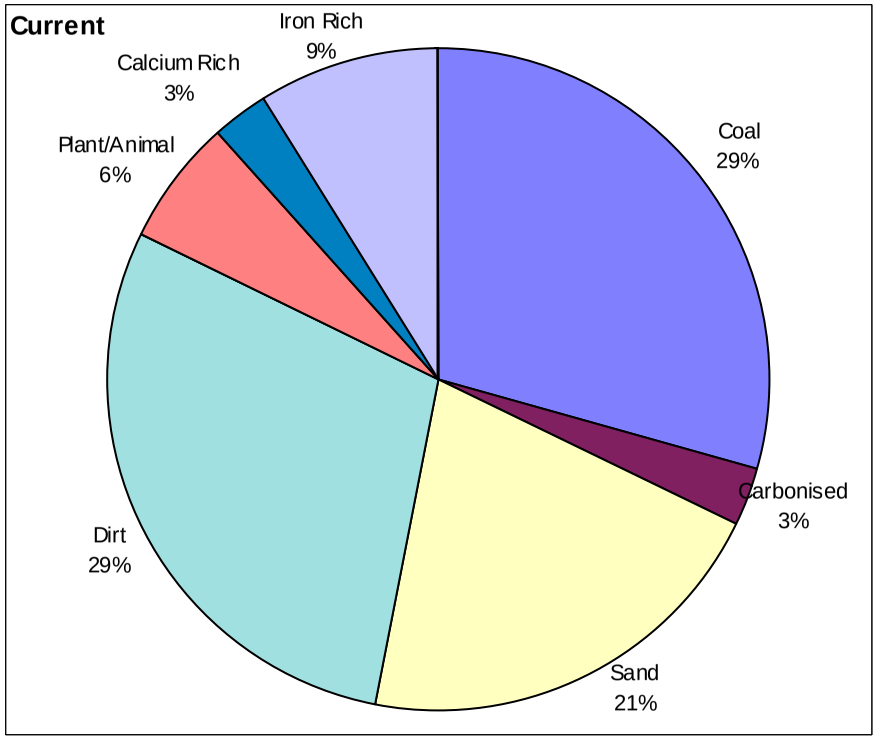
Cardonnel Road, Skewen

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/m2/day)	Current	10	1	7	10	0	2	1	3	0
	Previous	4	1	6	7	0	5	0	2	0

Figure 24

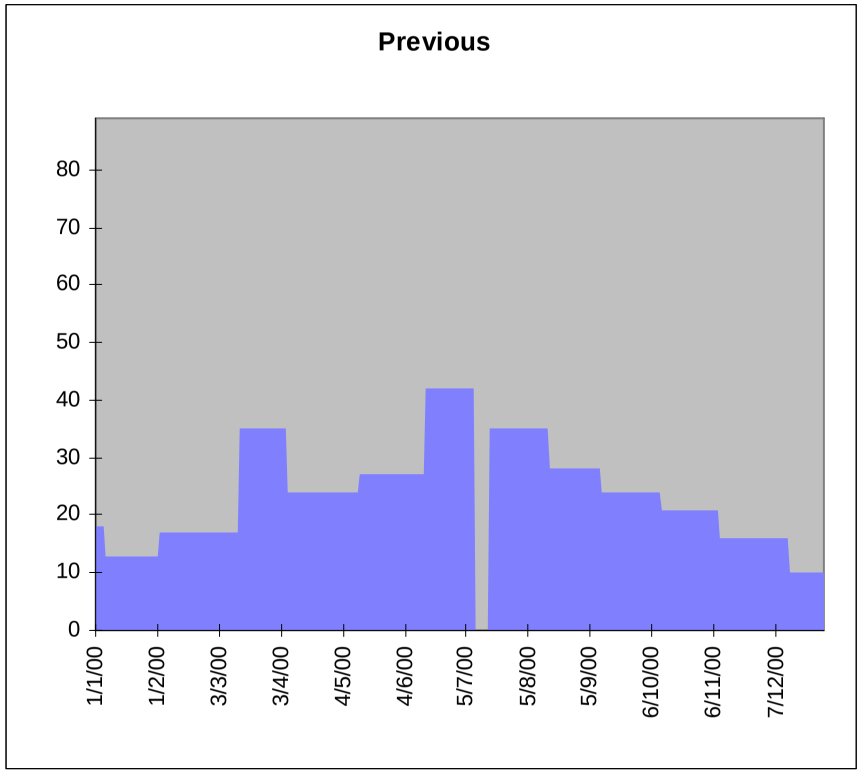
Deposit Gauge Analysis Report

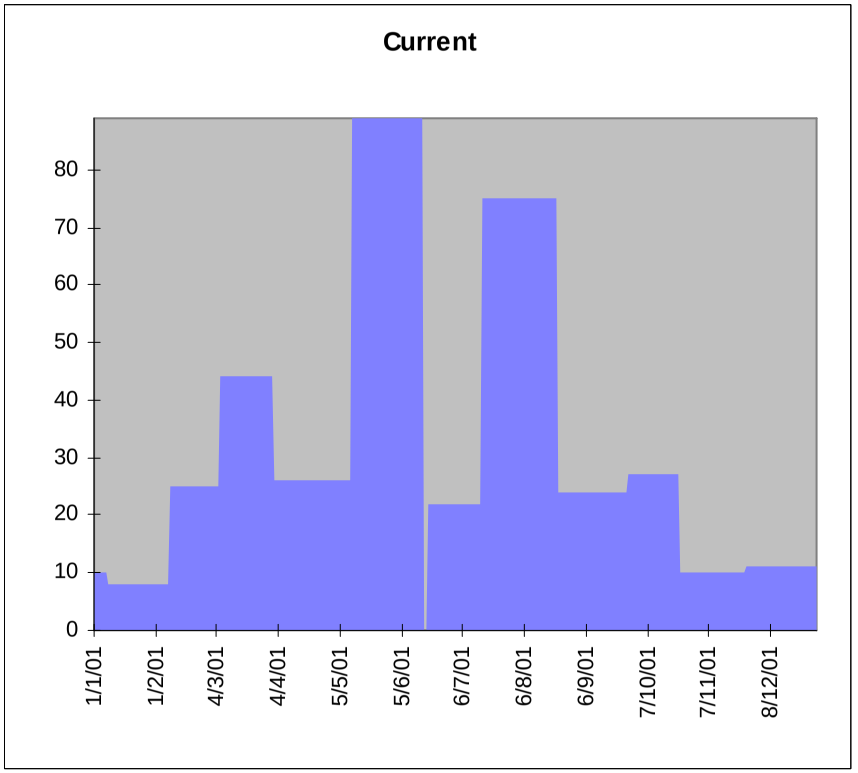
Cardonnel Road, Skewen

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	33	89	11	99.5	0	0
Previous	24	42	12	98.0	0	0
Change	9	Increase 38%				

Figure 25

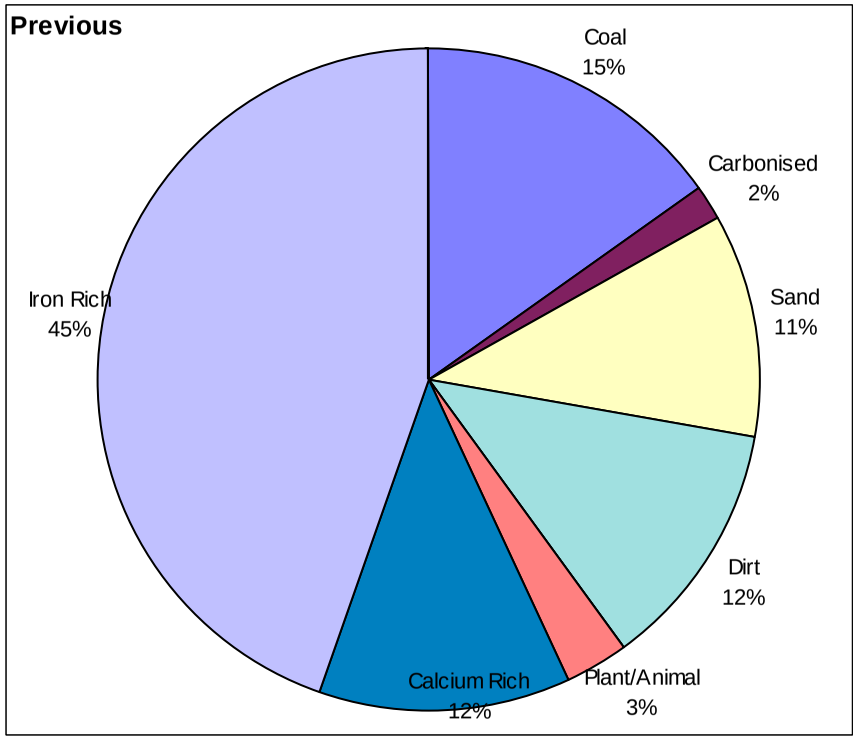
Deposit Gauge Analysis Report

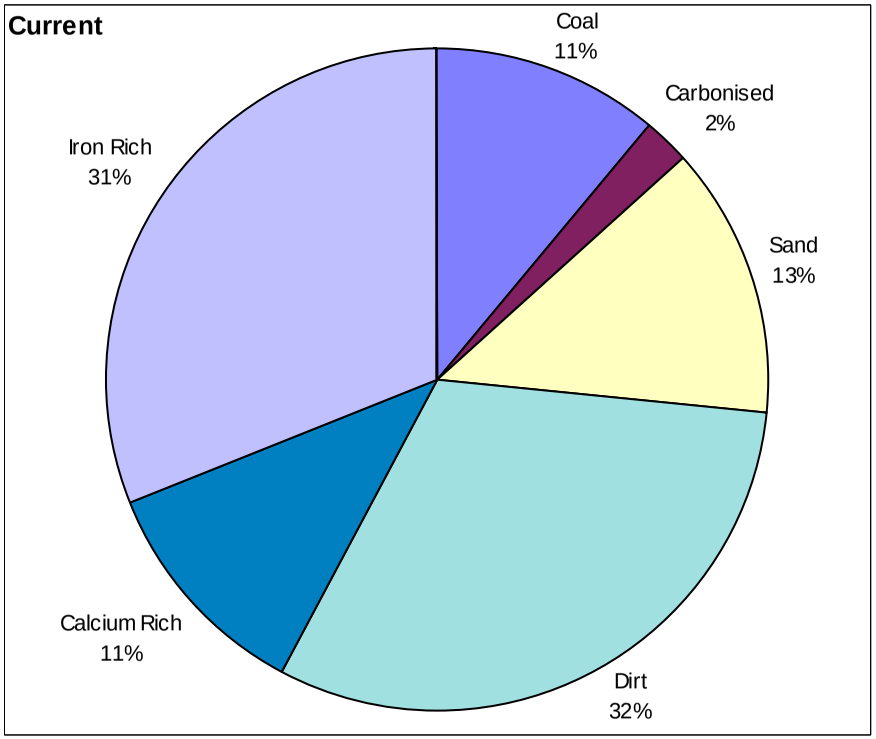
Little Warren, Port Talbot

Comparison of Fallout Composition

Current Period = 01-Jan-01 to 31-Dec-01

Previous Period = 01-Jan-00 to 31-Dec-00





Measurement Type	Period	Coal	Carbonised	Sand	Dirt	Fly Ash	Plant/Animal	Calcium Rich	Iron Rich	Others
Av. Deposition Rate (mg/M2/day)	Current	5	1	6	14	0	0	5	14	0
	Previous	10	1	7	8	0	2	8	29	0

Figure 26

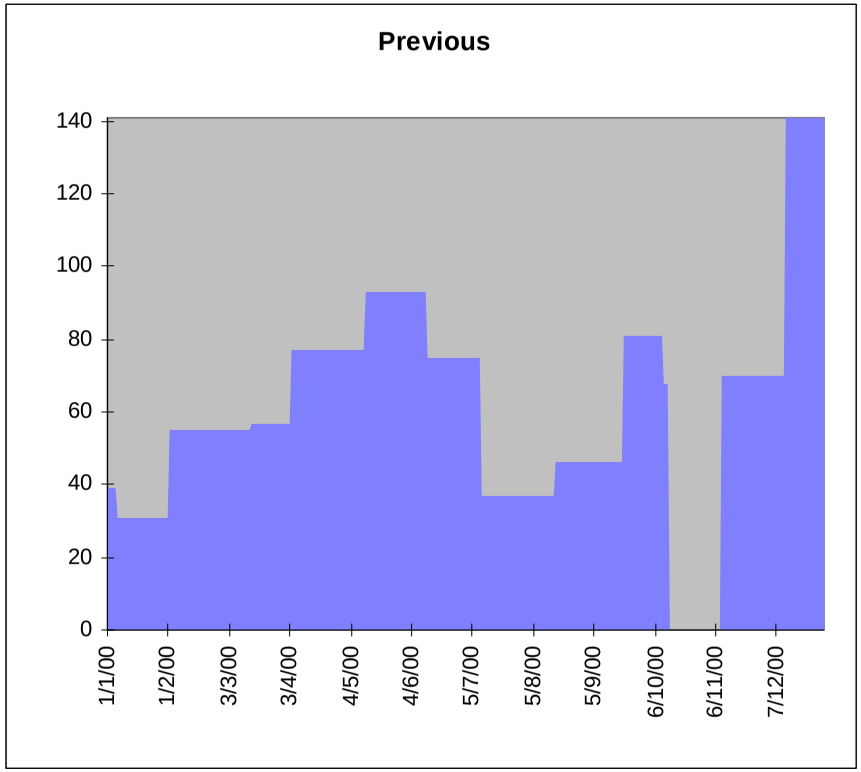
Deposit Gauge Analysis Report

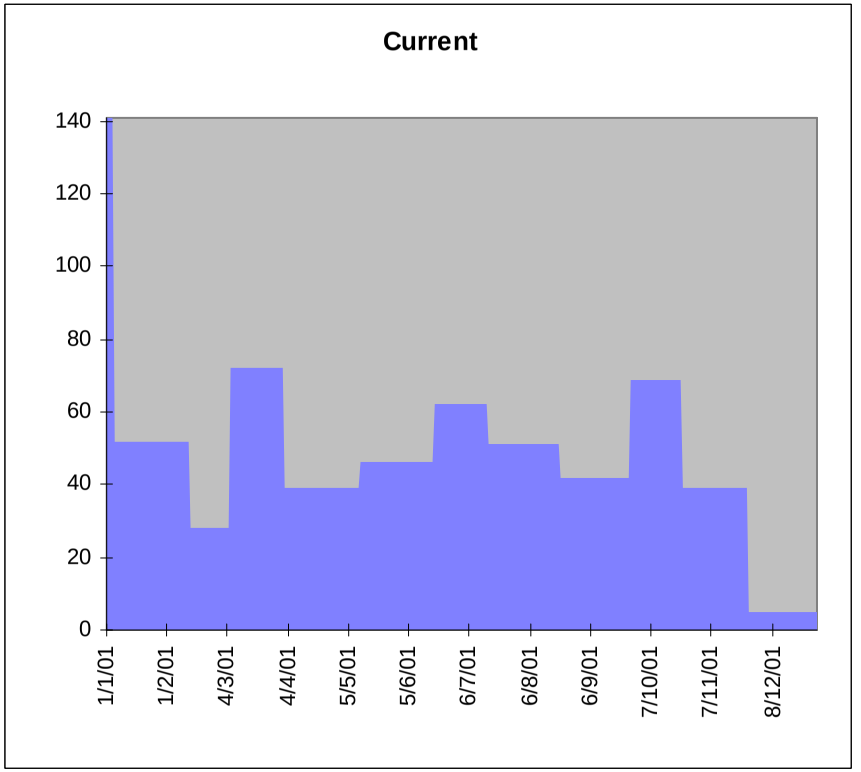
Little Warren, Port Talbot

Comparison of Fallout Rate with Time

Current Period = 01-Jan-01 to 31-Dec-01

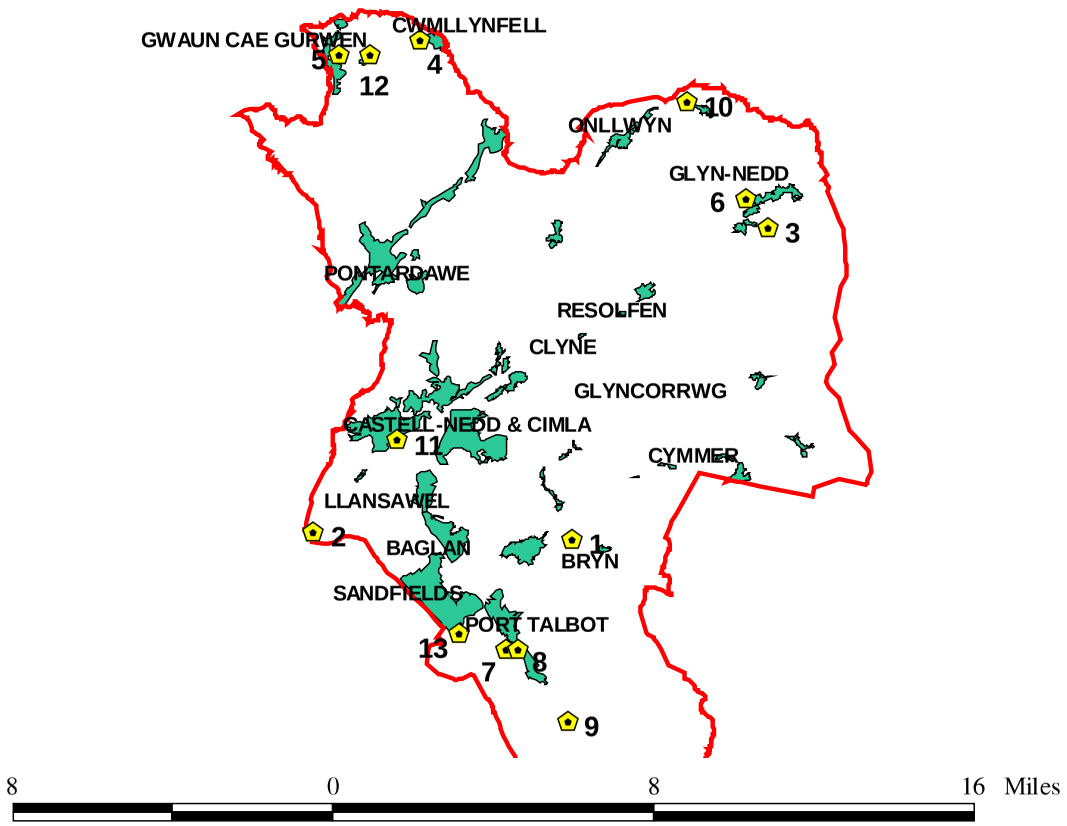
Previous Period = 01-Jan-00 to 31-Dec-00





Period	Fallout Level (mg/M2/day)		No. Samples	% Data Capture	200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum			Days within 10% of	Days Exceeding
Current	46	141	11	100.0	0	0
Previous	66	141	12	92.4	0	0
Change	-20	Decrease -30%				

Figure 27 Deposit gauge locations



No	Address
1	Cil Carne Farm, Bryn, Port Talbot
2	Jeremy's Oil Distributors, Baldwins Cre
3	41, Parish Road, Cwmgwrach
4	Ochwr y Waun, Cwmllynfell
5	Primary School, Gwaen Cae Gurwen
6	2, Llygad Yr Haul, Glynneath
7	Ffrwdwyllt House, Margam Road, Margam,
8	24, Prince Street, Margam, Port Talbot
9	Eglwys Nunydd Resevoir, Margam, Port Ta
10	11, Wembley Avenue, Onllwyn
11	Cardonnel Road, Skewen
12	Workingmens Club, Tairgwaith
13	Little Warren, Aberafan, Port Talbot

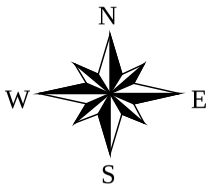


Figure 28 Comparison of average fallout rates, 2001.

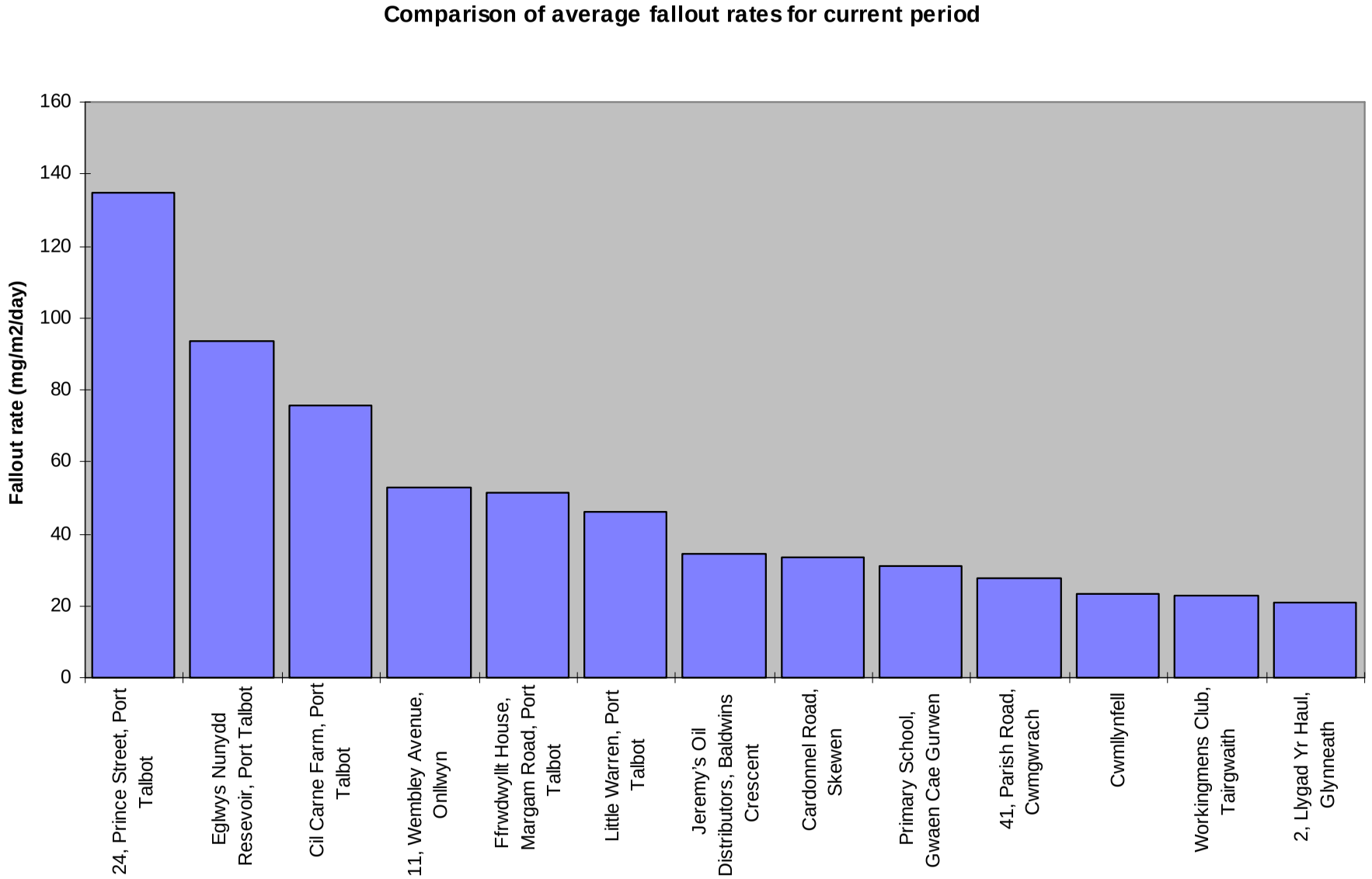


Table 1 Sites ranked by average fallout level (mg/m2/day), 2001.

Site Name	Fallout Level (mg/M2/day)		200 mg/M2/day 'Nuisance Limit'	
	Average	Maximum	Days within 10% of	Days Exceeding
24, Prince Street, Port Talbot	135	284	37	92
Eglwys Nunydd Resevoir, Port Talbot	93	453	0	35
Cil Carne Farm, Port Talbot	76	139	0	0
11, Wembley Avenue, Onllwyn	53	87	0	0
Ffrwdwyllt House, Margam Road, Port Talbot	51	221	0	22
Little Warren, Port Talbot	46	141	0	0
Jeremy's Oil Distributors, Baldwins Crescent	35	98	0	0
Cardonnel Road, Skewen	33	89	0	0
Primary School, Gwaen Cae Gurwen	31	172	0	0
41, Parish Road, Cwmgwrach	28	52	0	0
Cwmllynfell	24	44	0	0
Workingmens Club, Tairgwaith	23	36	0	0
2, Llygad Yr Haul, Glynneath	21	65	0	0

Figure 29 Long term deposition rates.

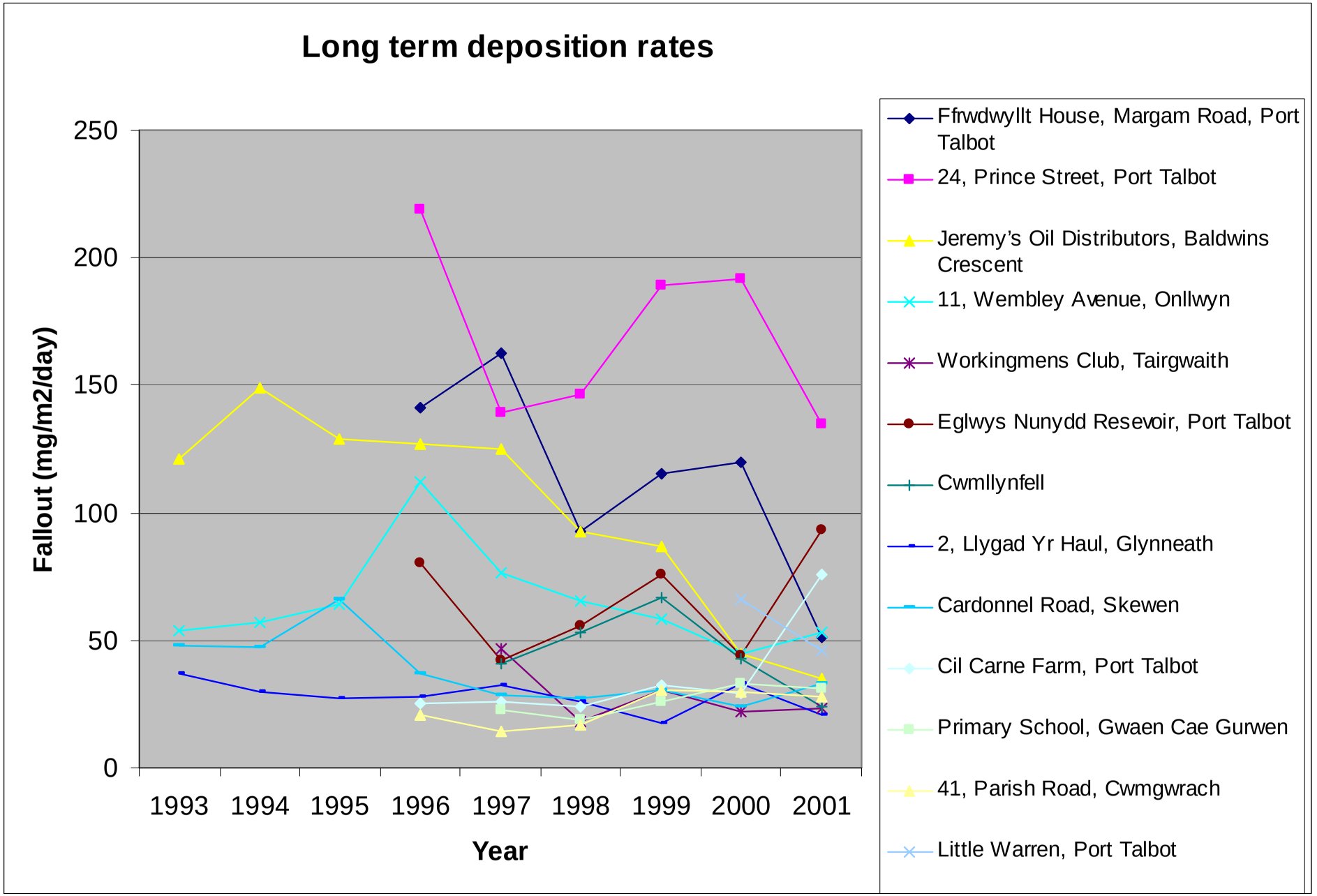


Table 2 Long term deposition rates

Site Name	Fallout rate (mg/m2/day)								
	1993	1994	1995	1996	1997	1998	1999	2000	2001
Ffrwdwyllt House, Margam Road, Port Talbot				141	163	92	115	120	51
24, Prince Street, Port Talbot				219	139	146	189	192	135
Jeremy's Oil Distributors, Baldwins Crescent	121	149	129	127	125	93	86	45	35
11, Wembley Avenue, Onllwyn	54	57	64	112	76	66	58	45	53
Workingmens Club, Tairgwaith					47	18	30	22	23
Eglwys Nunydd Resevoir, Port Talbot				80	42	55	76	44	93
Cwmllynfell					41	53	67	43	24
2, Llygad Yr Haul, Glynneath	37	30	27	28	32	26	18	33	21
Cardonnel Road, Skewen	48	47	66	37	28	27	30	24	33
Cil Carne Farm, Port Talbot				25	26	24	32	29	76
Primary School, Gwaen Cae Gurwen					23	19	26	33	31
41, Parish Road, Cwmgwrach				21	14	17	31	30	28
Little Warren, Port Talbot								66	46

Nitrogen dioxide - diffusion tubes

Neath Port Talbot County Borough is one of approximately 300 local authorities that contribute to the UK Nitrogen Dioxide Survey. The survey is co-ordinated by AEA Technology, which is also responsible for quality control/assurance, interpretation and dissemination of data. There are three categories of site i.e. kerbside, intermediate and urban background. Individual authorities normally have four tubes, two of which are of the urban background type. Following the merger to the unitary Authority, the County Borough has inherited the monitoring commitments of the previous Borough Councils (10 tubes). AEA Technology disseminates annual reports, both in written and electronic form. The most recent of the annual reports that have been subject to final ratification is the 1998 report. This and other reports can be obtained via the Internet at the following address: http://www.aeat.co.uk/netcen/airqual/data/nonauto/no2tube.html. Alternatively, the printed reports are available to view via Peter Hollingsworth (Principal Officer, Environment), Neath Civic Centre. This report summarises the data for 2000, obtained from the ten locations in the County Borough where nitrogen dioxide tubes are located.

Pollutant information

Nitrogen dioxide is one of a number of nitrogen oxides that are formed during high temperature combustion processes from the oxidation of nitrogen in the air or fuel. Road traffic is the main source, being the cause of approximately 50% of all European emissions. Concentrations tend therefore to be highest in urban environments with high traffic levels and in the vicinity of large industrial sources.

Nitrogen dioxide is a respiratory irritant and also plays a part in production of another atmospheric pollutant, Ozone. Nitrogen oxides persist in the atmosphere for only about one day before they are oxidised to nitric acid. Nitrogen oxides therefore play a part in the production of acid rain.

Results

Table 3 shows the results for 2001, together with summary averages for the year as a whole. The individual results are shown graphically in Figure 31, whilst Figure 32 shows the annual averages for each site. The locations of the sites are shown in the attached map (Figure 30).

These studies have been on going since 1994 the changes in annual averages that have occurred at each location are again reviewed. These results are shown graphically in Figure 33.

In late 2001 the Cardiff Public Analyst went out of business at short notice, resulting in a gap in the data until a new laboratory was retained towards the end of the year. Monitoring was subsequently resumed in January of 2002. On the basis of this reduced dataset, results at all locations appeared to increase during 2001. However, it is not clear the extent to which this would be expected to be different if all samples had been successfully collected.

The Victoria Gardens location continues to produce the highest results. There is an EC Directive Limit and Guide values that pertain to nitrogen dioxide concentrations. However, the Directive is based upon the measurement of hourly nitrogen dioxide levels, not monthly averages. Surrogate statistics are available which are based upon the annual average of the monthly diffusion tube samples. The corresponding surrogate statistic for the limit is 48ppb and 28ppb for the guide value. No local sites have ever come close to breaching the limit or guide values during 2001. The National Air Quality objective for NO_2 is 21 ppb as an annual average, to be achieved by 2005. The Victoria Gardens site is the closest to this figure 20.6ppb 2001.

Figure 30 Nitrogen dioxide diffusion tube locations

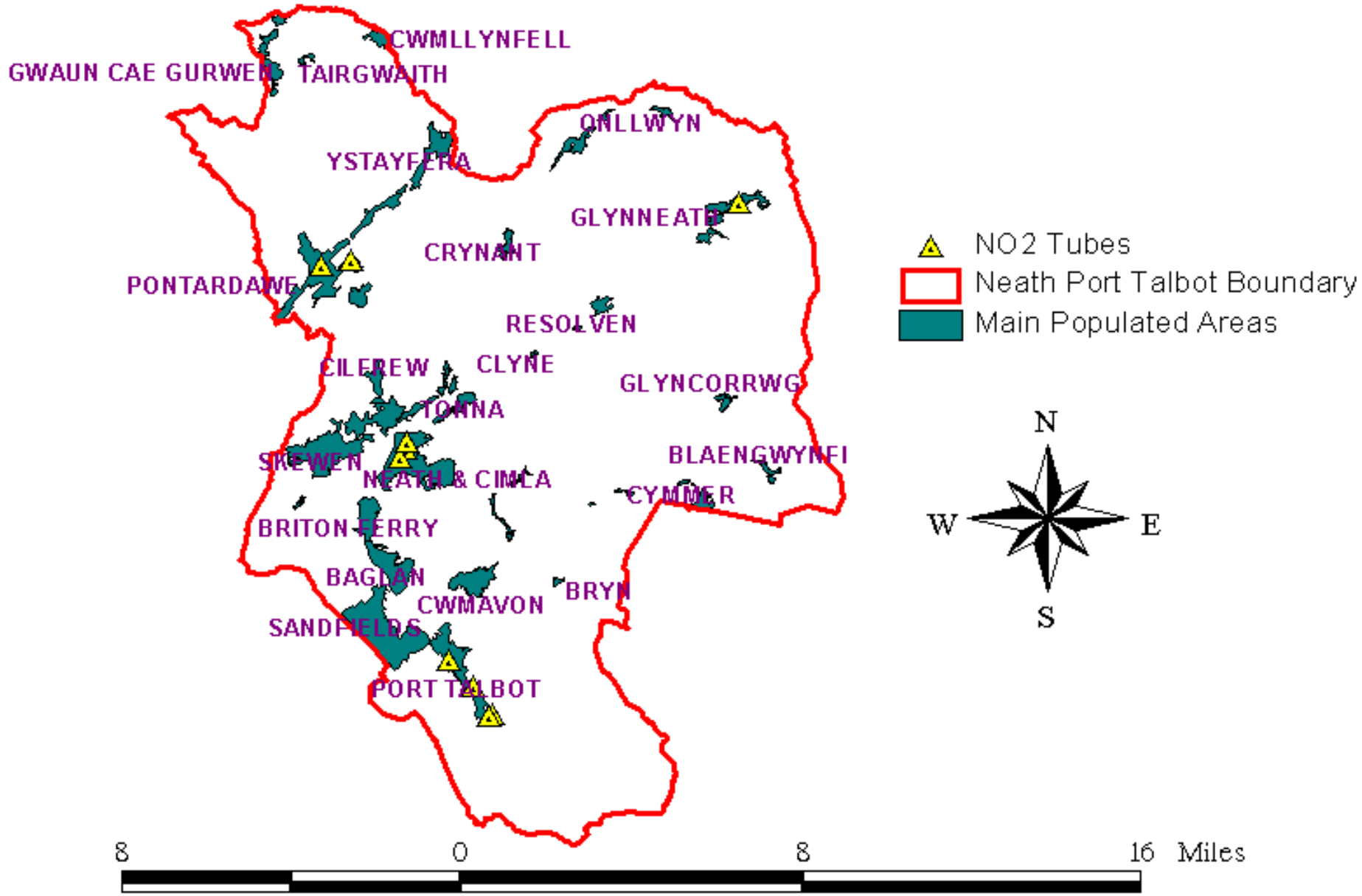


Table 3 Nitrogen Dioxide Diffusion Tube Results (ppb) – 2001

Site	Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Neath Civic Centre	UB	13.7	14.6	9.2	6.1	7.2	7.2	7.8	6.1	7.1				8.8
London Road, Neath	I	10.4	17.4		20.6	9	8.8	13.2	9.9	14.5				13.0
Cwmnedd Primary School, Glynneath	UB	11.2	7.7	7.7	5.1	1.9	4.4	5.3	4.4	7.8				6.2
Groeswen Hospital, Margam	I	15.7	17.6	11.9	9.3	8.7	4.9	12						11.4
Rice Street, Taibach	UB	9	10.5	8.7	8.8		10.5	5.4	6.7	8.9				8.6
Margam Road, Margam	I	11.8	11	7.8	8.2	7.7	5.5	10.4	6.9	7.5				8.5
College Green, Margam	UB	10.2	10.5	8.9	4	3.9	5.5	8.2	7.1	8.7				7.4
High St., Pontardawe	K	7.2	13.2	12.4	10.3	12.1	10	9.5		14.9				11.2
Godrergraig, Pontardawe	I	7.4	6.7	7.3	4	4.6	4.9	3.9	4.3	5.2				5.4
Victoria Gardens, Neath	K	12	15.9	21.2	14.7	13.1	15	14.4	13.3	22.3				15.8

Key:
UB – Urban background location
I – Intermediate location
K – Kerbside location
ND – No data

Table 4 Nitrogen dioxide annual averages (ppb) – 1994 - 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
Neath Civic Centre	17.7	17.8	12.4	11.6	11.7	10.2	8.7	8.8
London Road, Neath	24.1	23.8	18.5	14.5	15.4	16.0	12.5	13.0
Cwmnedd Primary School, Glynneath	13.0	13.7	9.0	7.7	7.8	6.2	6.3	6.2
Groeswen hospital, Margam	16.6	17.3	14.9	11.9	13.6	8.4	9.9	11.4
Rice Stree, Taibach	15.5	17.5	11.6	9.9	10.6	10.0	8.7	8.6
Margam Road, Margam	12.7	14.0	8.0	10.9	11.2	9.4	9.2	8.5
College Green, Margam	10.7	11.6	11.9	10.0	9.4	7.6	7.7	7.4
High St., Pontardawe	15.9	11.9	11.2	19.7	12.8	10.3	10.7	11.2
Godrergraig, Pontardawe	ND	ND	ND	ND	7.3	6.3	5.9	5.4
Victoria Gardens, Neath	28.3	28.3	20.1	20.6	20.7	17.1	17.0	15.8

Figure 31 Monthly nitrogen dioxide diffusion tube results (ppb) – 2001

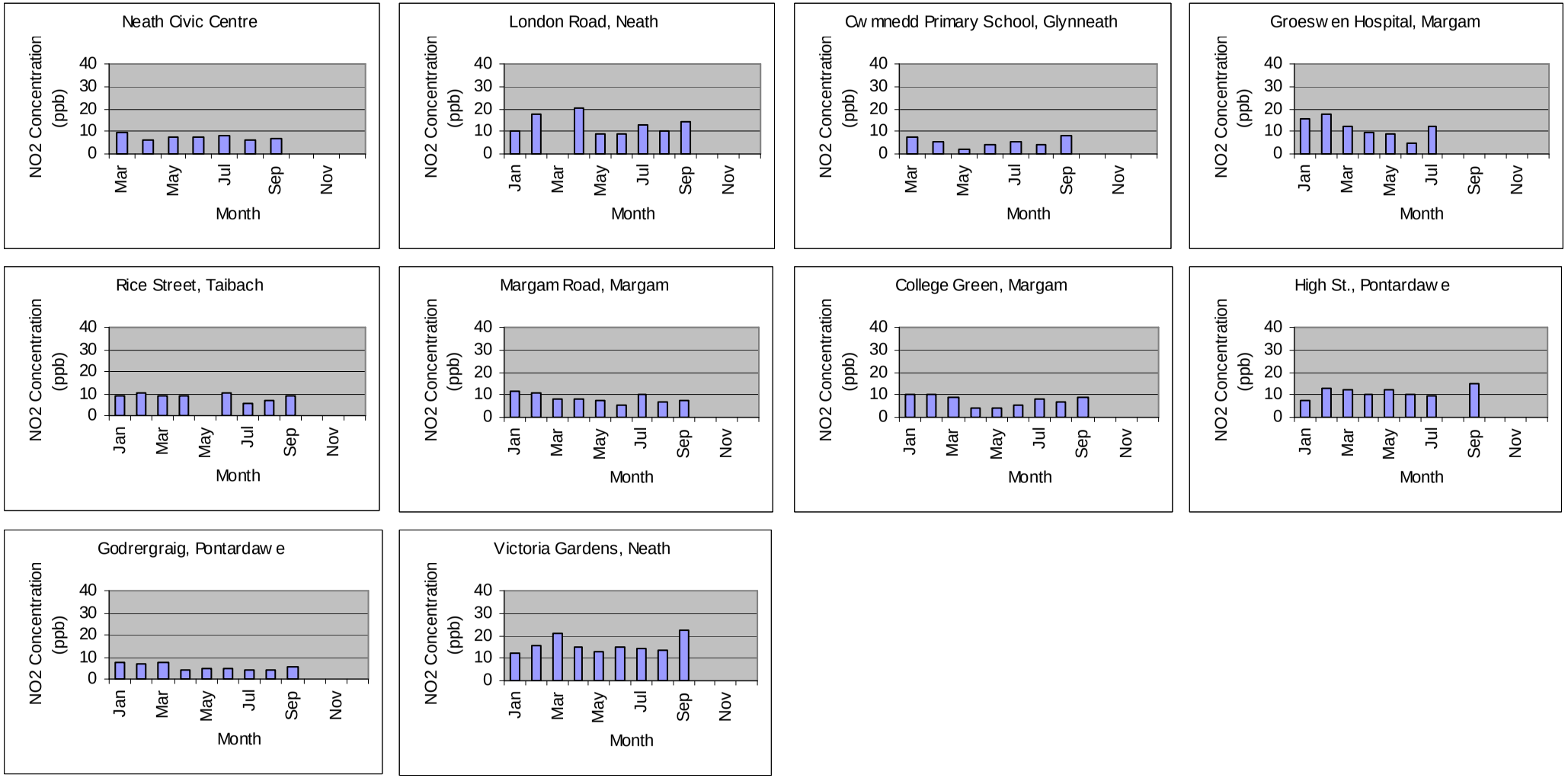


Figure 32 Nitrogen dioxide annual averages – 2001

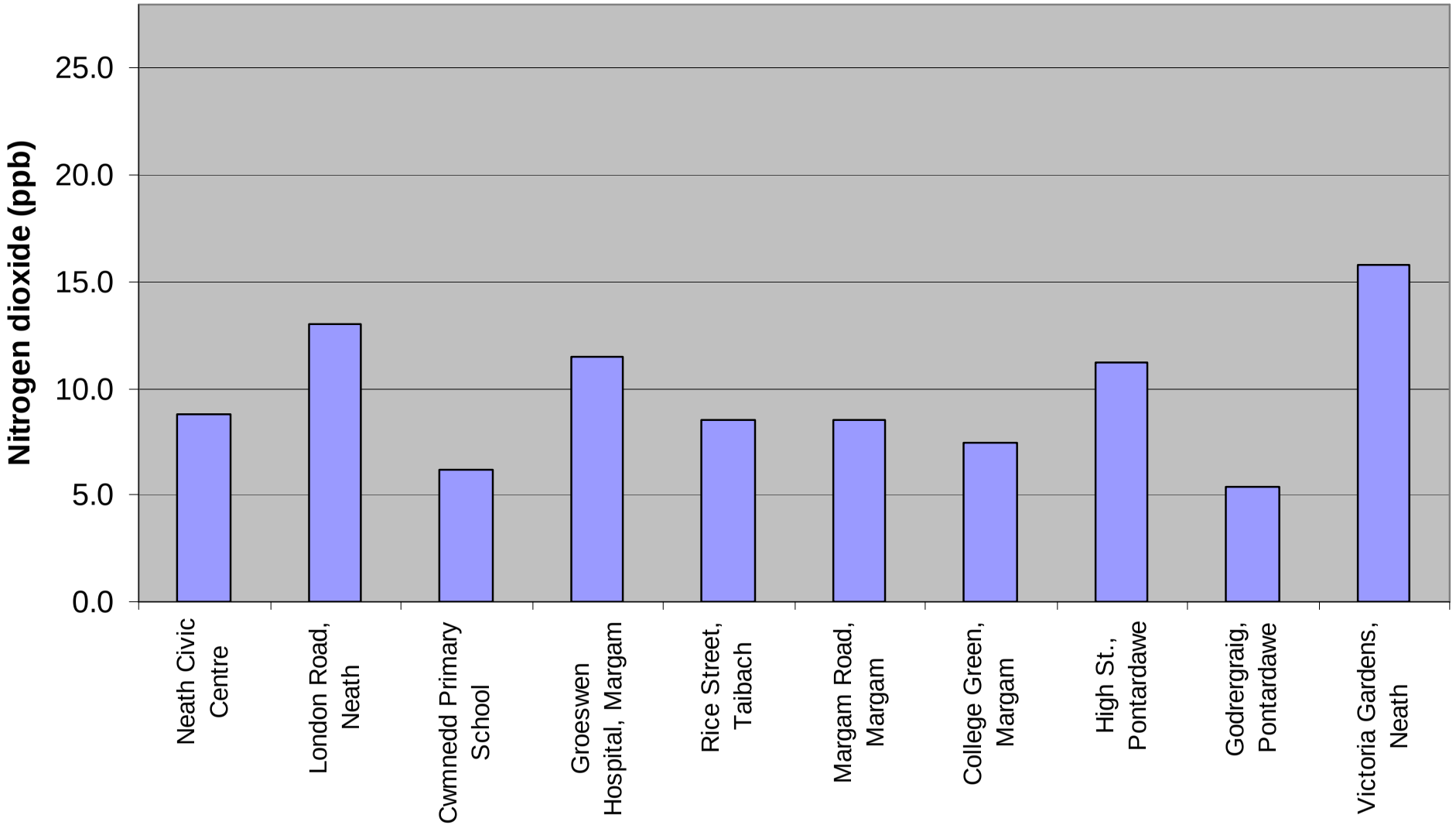
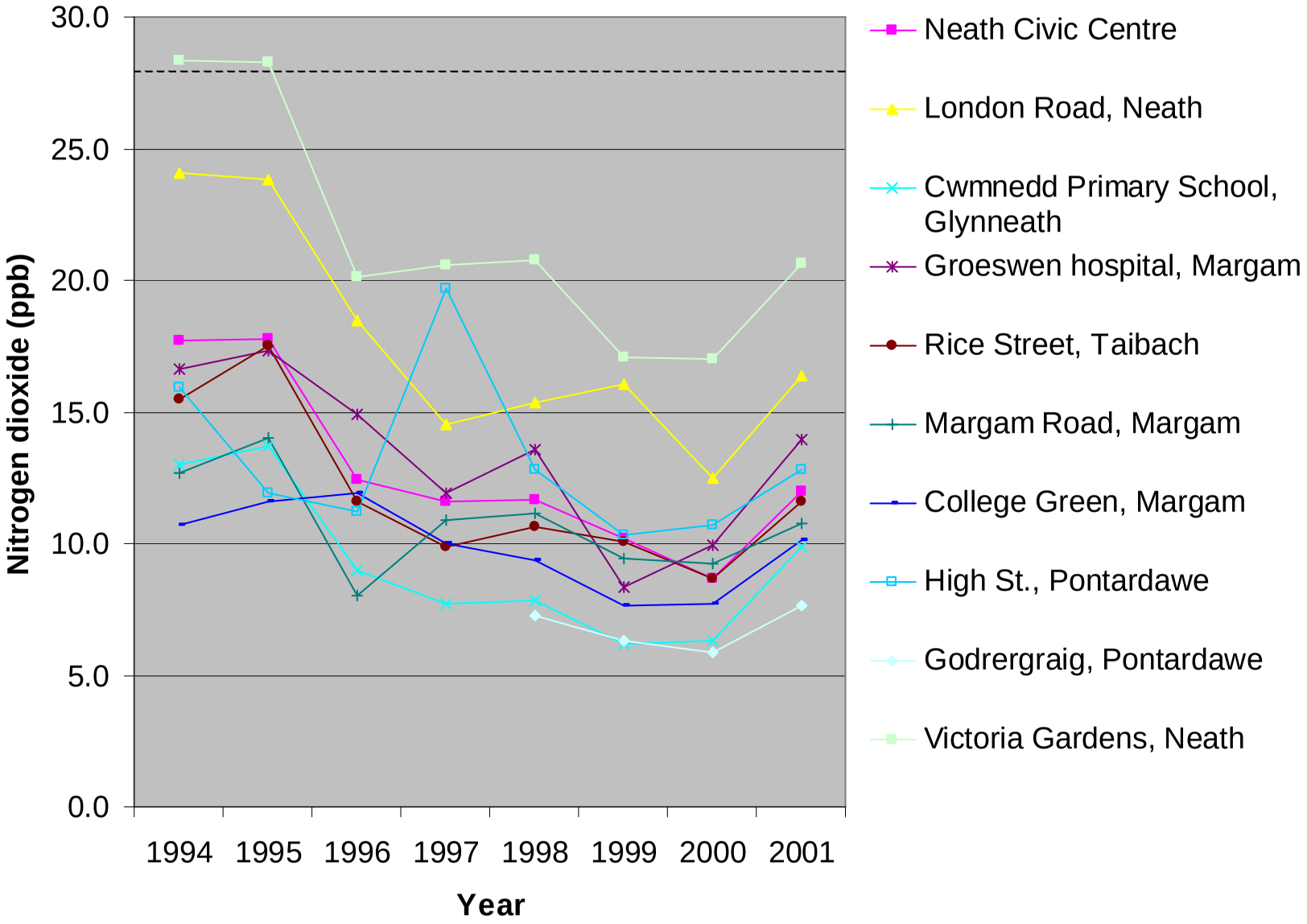


Figure 33 Annual nitrogen dioxide summary graph



Smoke and sulphur dioxide – UK bubbler survey 2001

The UK smoke and sulphur dioxide network has been in operation since the 1960's. The equipment comprises of a timer that activates a valve, which selects one of eight filter and impinger pairs. In this way air is sampled so as to give a daily average for sulphur dioxide and smoke. This Authority now operates one '8 port valve' on the network, which is located at Cwm-Nedd Primary School, Glynneath.

Results

There are EC air quality guidelines and limits for sulphur dioxide and smoke. These standards are a little complex, the sulphur dioxide limits being dependent upon the smoke results. The limits were structured in this way because sulphur dioxide and smoke can have a synergistic effect, high concentrations of both substances can produce a greater health effect than that attributed to each of the individual pollutants. The EC standards and guidelines are shown in Table 5 below:

Table 5 Guidelines and standards for non-continuous sulphur dioxide/smoke bubblers

EC Directive Limit Values for Smoke and Sulphur Dioxide (μg/m^3)		
Reference Period	**Smoke**	**Limit Values for Sulphur Dioxide**
Year (median of daily values)	68	If smoke <=34:120 If smoke >34:80
Winter (median of daily values October – March)	111	If smoke <=51:180 If smoke >51:130
Year (peak) (98 percentile of daily values)	213	If smoke <=128:350 If smoke >128:250
EC Directive Guide Values for Smoke and Sulphur Dioxide (μg/m^3)		
Reference Period	**Smoke**	**Guide Values for Sulphur Dioxide**
Year (arithmetic mean of daily values)	34 to 51	40 to 60
24 Hours (daily mean value)	85 to 128	100 to 150

The current EC limits are based around a reporting period between 1st April and 31st March the following year. However, the government reports on a calendar year basis and the results for Glynneath are shown in Table 6 below:

Table 6 Smoke and sulphur dioxide results 2001, Glynneath

Statistic	Smoke and Sulphur Dioxide (μg/m^3)	
	Smoke	**Sulphur Dioxide**
Average	3	22
Median	2	26
98th Percentile	15	47
Maximum daily	24	51
Data capture (%)	87	87

Average sulphur dioxide levels decreased from 29 μg/m^3 in 2000 to 22 μg/m^3 in 2001, a result more similar to the 1999 levels (20 μg/m^3). Average smoke levels in 2001 also regressed back to their 1999 concentration of 3 μg/m^3, having reached 4 μg/m^3 during 2000. No breaches of any EC limit or guide values occurred during the monitoring period. The National network data for 2001 shows that the average smoke level in the UK during 2001 was 8.2 μg/m^3 and the average sulphur dioxide level was 14.8 μg/m^3. Smoke levels during 2001 would therefore appear to be quite low, whilst the average sulphur dioxide concentrations continue to be slightly above average. There were significant instrument problems during the year, which resulted in a lowering of the data capture rate.

Metals monitoring at Pontardawe

Monitoring of the concentrations of 13 airborne metals has been carried out continuously in the Pontardawe area since 1972. Pumps continuously sample ambient air and particles are collected on filters that are analysed by AEA Technology. Until 1997, this work was carried out at Trebanos Sewage Works. Following a programme of construction at the site, monitoring was re-located to Pontardawe Leisure Centre. The objectives are to establish whether the Nickel works at Clydach has any significant impact upon metal concentrations in the area. The new site is approximately 4km downwind of the Nickel works, as compared to the Trebanos site, which was about 2km from the works.

Monitoring was carried out in respect of the following metals:

- Lead (Pb)
- Nickel (Ni)
- Zinc (Zn)
- Arsenic (As)
- Cadmium (Cd)
- Chromium (Cr)
- Copper (Cu)
- Iron (Fe)
- Cobalt (Co)
- Selenium (Se)
- Antimony (Sb)
- Cerium (Ce)
- Scandium (Sc)

Results

Four of the thirteen metals showed an increase in annual air concentration and nine showed a decrease compared to 2000. The metals that showed an increase were arsenic, cadmium, lead and antimony. Antimony was the only metal to show a relatively large increase (25%). The metals that showed decreases were cerium (71%), cobalt (18%), chromium (21%), copper(1%), iron(40%), nickel (6%), selenium (9%), zinc(84%) and scandium (65%).

Figures 34 to 38 show how the concentrations of the metals have changed since 1972. Reductions in air concentrations from the 1972-1979 to the 1990-2001 periods vary from 11% to over 80%. The largest reductions have been seen for cadmium (82%), cobalt(80%), lead (76%), chromium (71%), copper (72%) and zinc (71%). Considerable reductions have also been seen for arsenic (64%), cerium (47%), iron (28%), nickel (55%), antimony (39%) and selenium (38%). These reductions are as a result of a general reduction in emission of metals from various sources such as traffic, industry and combustion.

The annual mean concentration of arsenic, cadmium and lead were all found to be well below the expected or present EC limit values. The measured concentration of arsenic was found to be 18% of the proposed EC limit value whereas for cadmium it was less than 5%. Lead has a current EC Directive Limit value of 2μg/m^3 and the UK's air quality objective for lead (to be achieved by 2008) is 0.25μg/m^3. The concentration of lead found at Pondardawe was 12.6ng/m^3 which is approximately 0.6% of the limit value and 5% of the UK's air quality objective.

The annual mean concentration of nickel at Pontardawe was found to be 41ng/m^3, which is similar to that found in previous years of monitoring. But, this concentration is twice the anticipated EC Daughter Directive Limit value, which is expected to be 20ng/m^3.

No comparisons could be made with other semi-rural sites in England since the data had not yet been made available at the time of writing.

Table 7 Threshold Limit Ealues and Environmental Air Guidlines.

Element	Current or proposed Air Quality Limit Values (ng/m^3)	Environmental Assessment Level (EAL)## ($ng\ m^{-3}$)	Comment on form	Annual Mean Air Concentration in 2000 ($ng\ m^{-3}$)	% of Environmental Assessment Level (EAL)
Arsenic (As)	6		Proposed Limit Value	1.1	18
Cadmium (Cd)	5		Proposed Limit Value	0.23	4.6
Cobalt (Co)		200##	Cobalt and its compounds as Co	1.2	0.6
Chromium (Cr)		100##	Cr VI compunds	4.4	4.4
Copper (Cu)		10000##	Dust, fume and mists	3.9	0.039
Iron (Fe)		10000##	Iron salts as Fe	208	2.1
Nickel (Ni)	20		Proposed Limit Value	41.4	210
Lead (Pb)	2000* (500)** (250)***		Inorganic compounds	12.6 12.6 12.6	0.63 2.5 5
Antimony (Sb)		5000##		1.42	0.028
Selenium (Se)		1000##	Not including hydrogen selenimide	0.52	0.052

Notes:

1. # Expected proposed Air Quality Limit Values taken from ranges produced by Position paper. Ambient Air Pollution by As, CD and Ni Compounds (EC, 2000).
2. ## Environmental Assessmemt Levels: IPPC H1 Environment Agency Version 1, June 2001.
3. * Current EC Directive limit value for annual mean air concentration.
4. ** EU Daughter Directive (1999) limit value and DEFRA air quality objective to be met by 31st December 2004 (annual mean air concentration).
5. *** DEFRA air quality objective for Pb in the UK to be met by 2008 (annual mean air concentration).

Figure 34

Mean Annual Concentrations of Cerium and Scandium in Air at Trebanos (1972-1996) and Pontardawe (1997-2001)

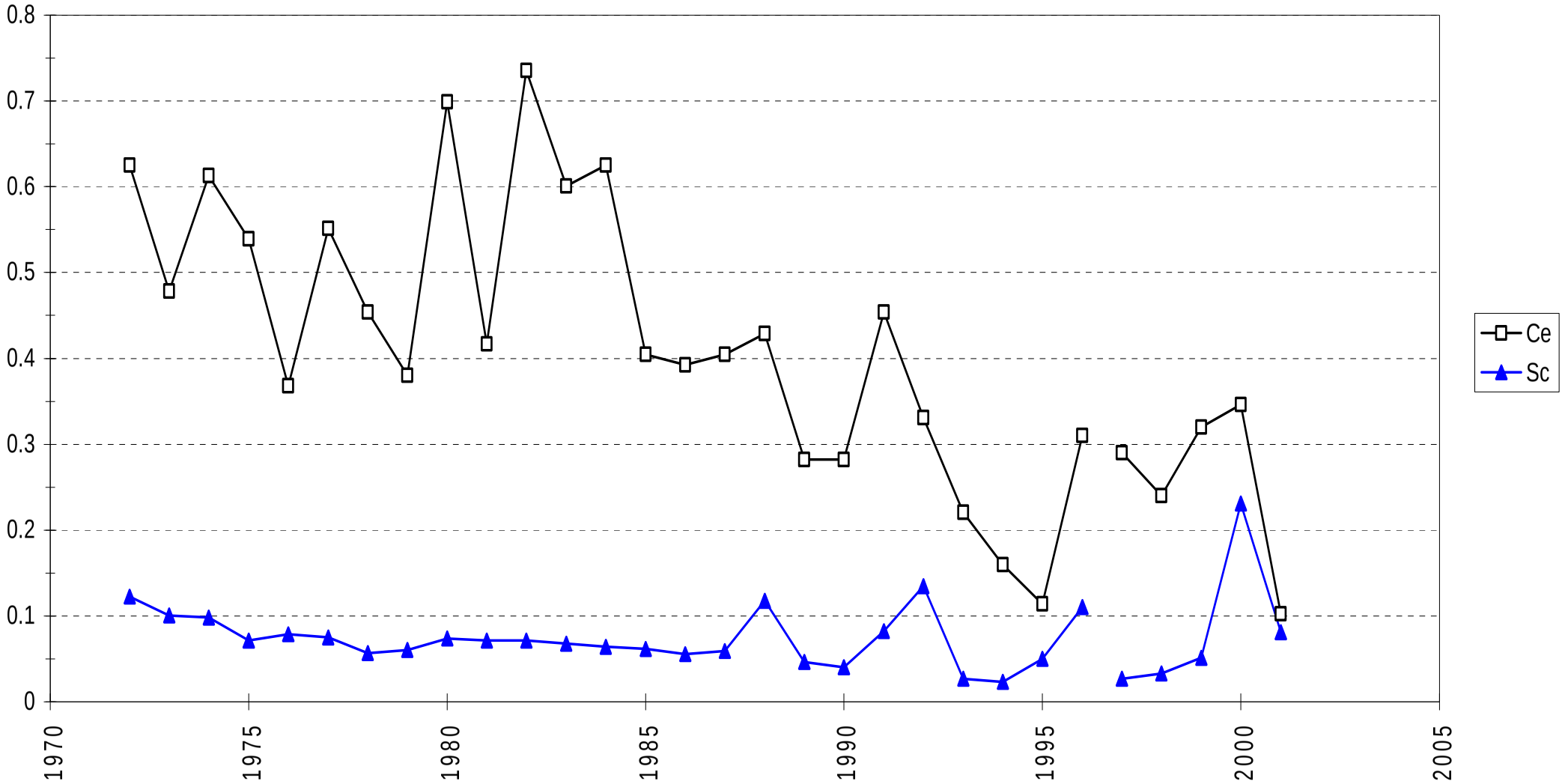


Figure 35

Annual Mean Concentrations of Antimony, Cobalt and Selenium in Air at Trebanos (1972-1996) and at Pontardawe (1997-2001)

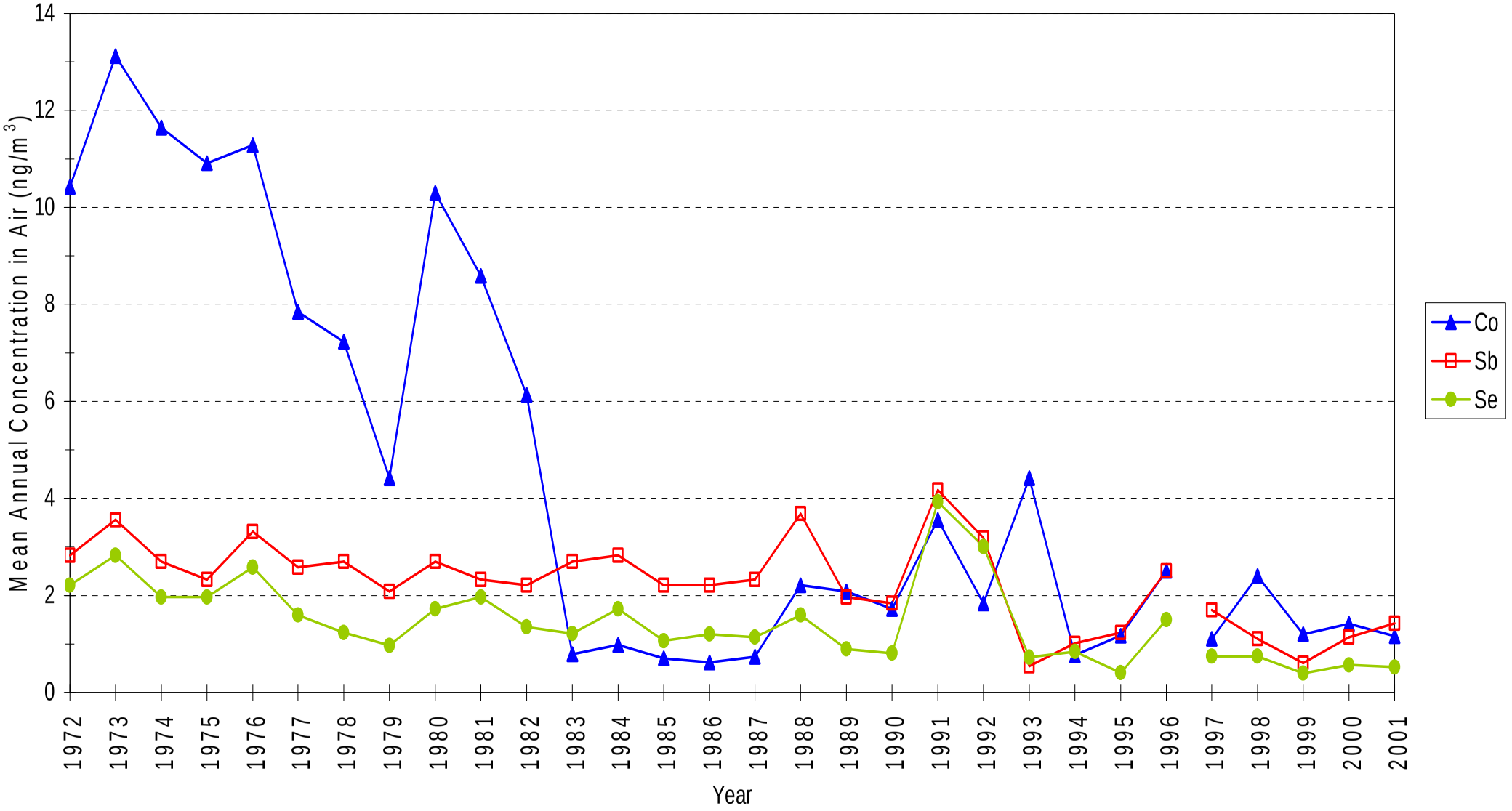
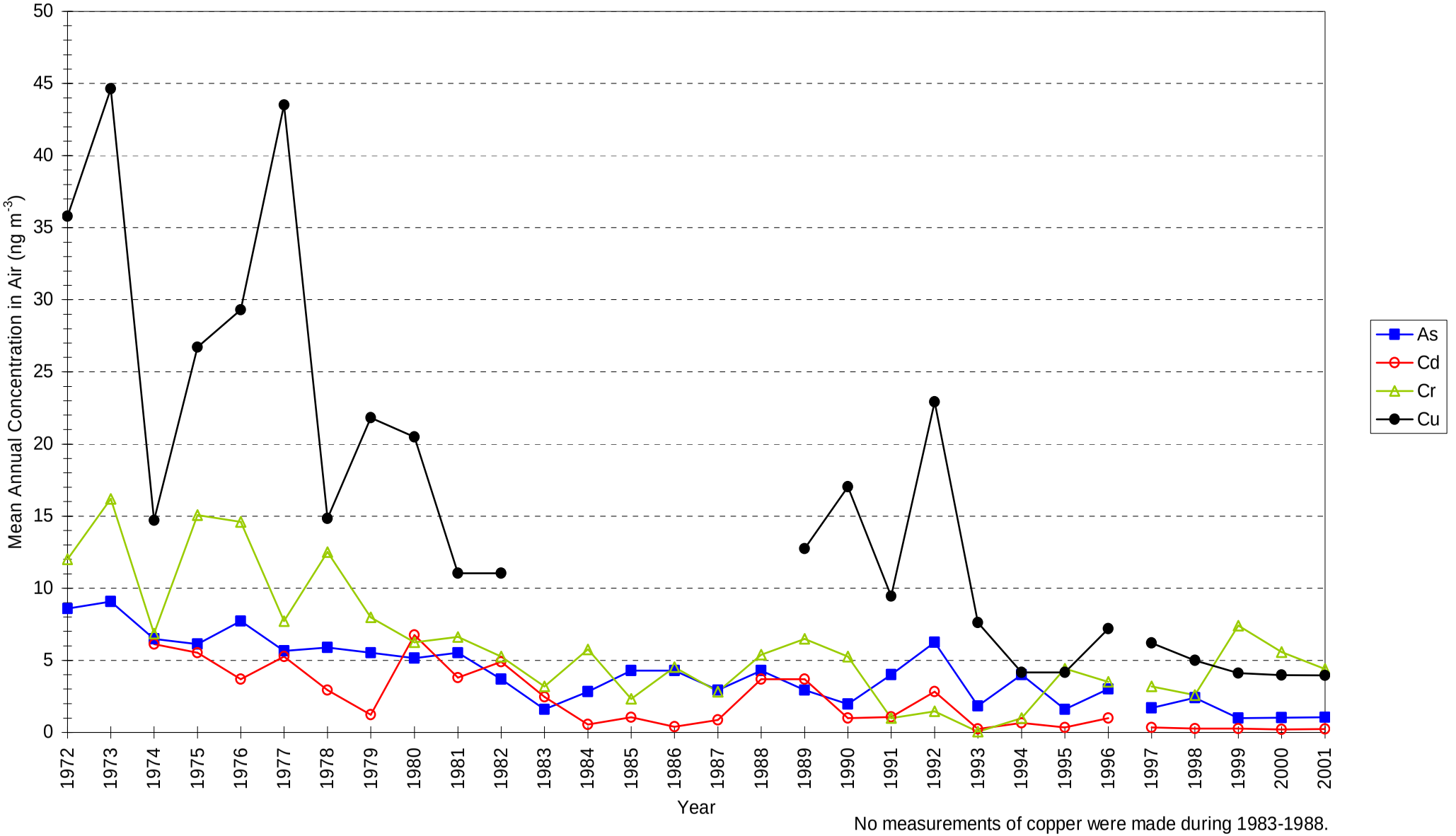


Figure 36

Annual Mean Concentrations of Arsenic, Cadmium, Chromium and Copper in Air at Trebanos (1972-1996) and at Pontardawe (1997-2001)



No measurements of copper were made during 1983-1988.

Figure 37

Annual Mean Concentrations of Iron in Air at Trebanos (1972-1996) and at Pontardawe (1997-2001)

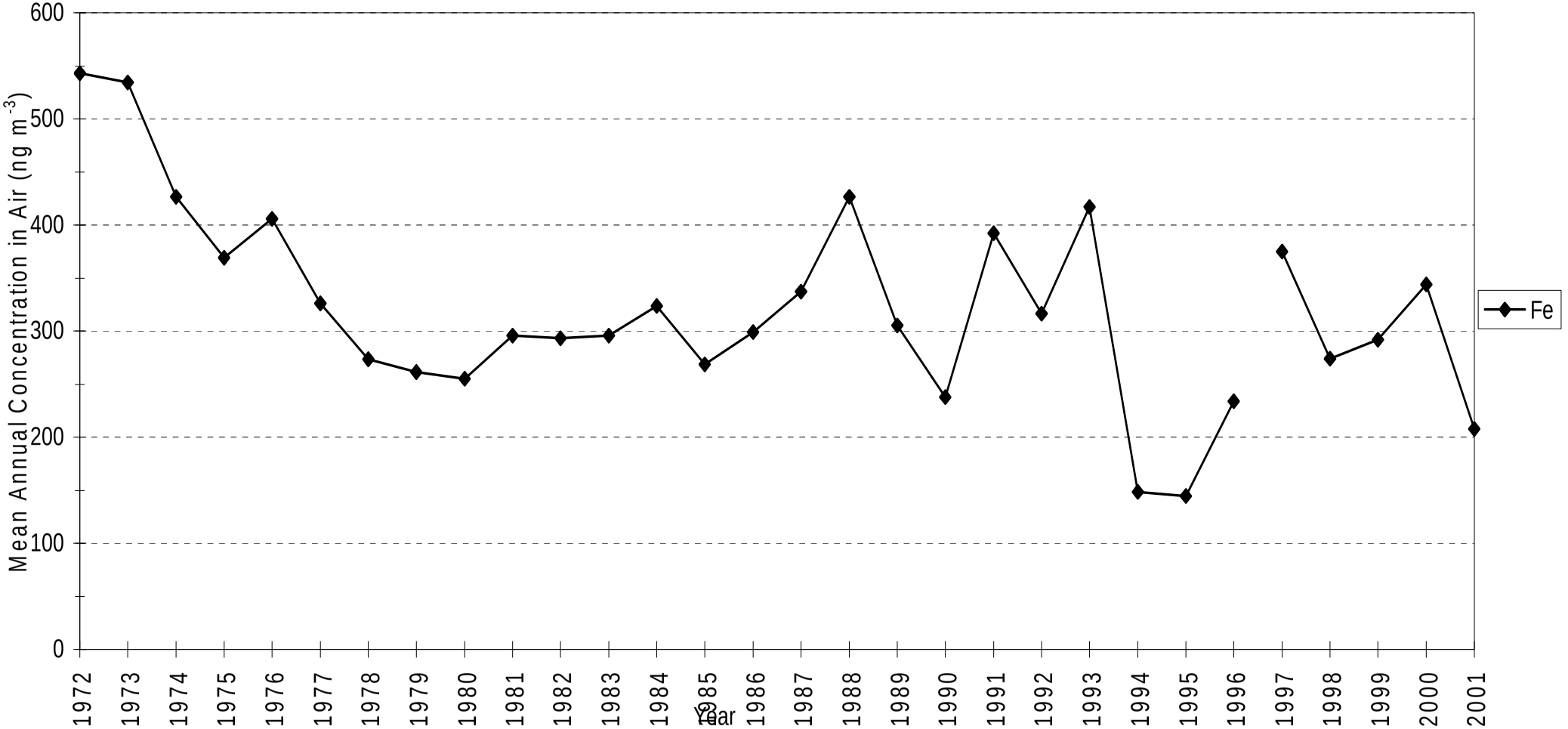
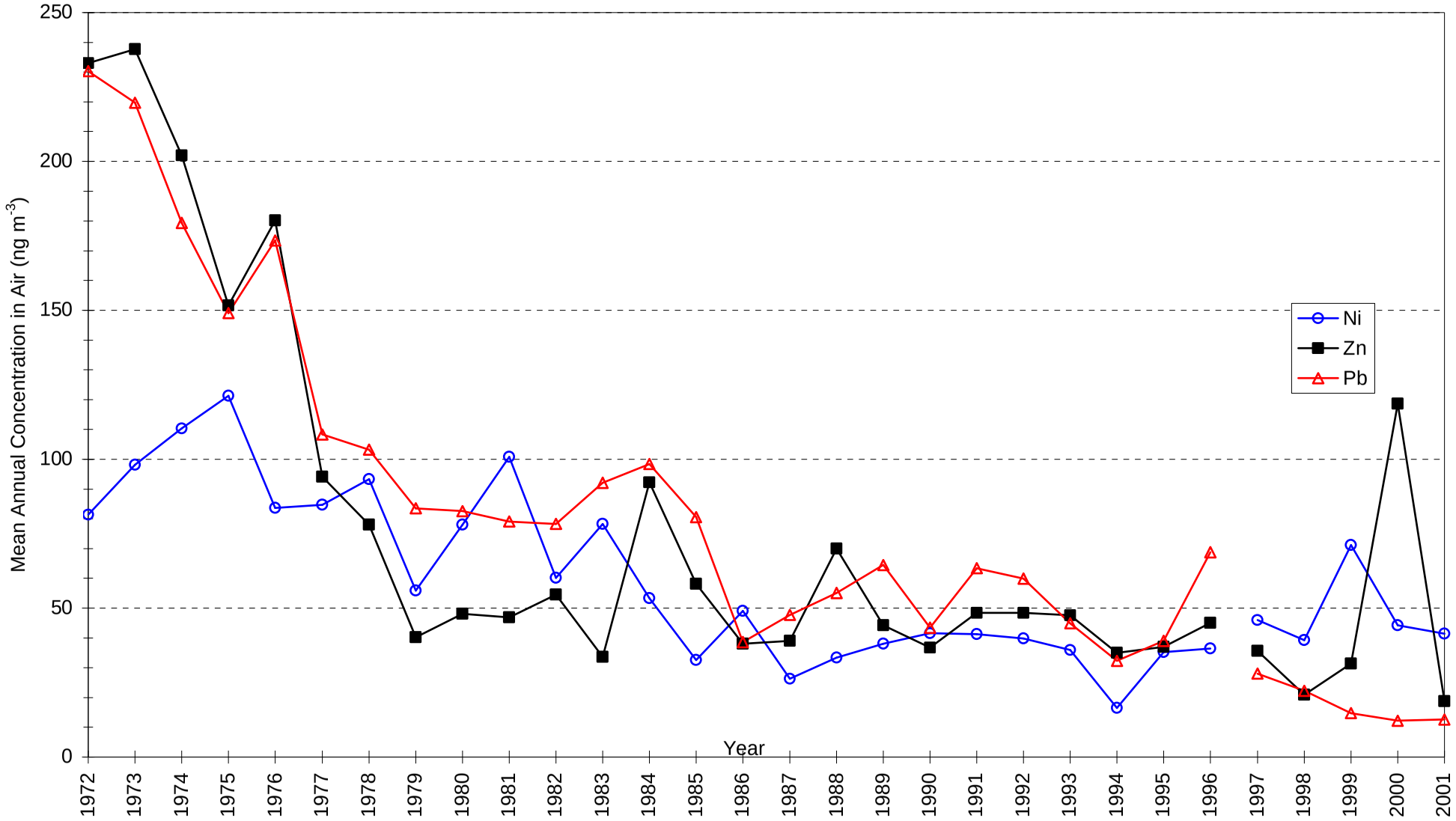


Figure 38

Annual Mean Concentrations of Lead, Nickel and Zinc in Air at Trebanos (1972-1996) and at Pontardawe (1997-2001)



Particles and inorganics
Groeswen Hospital, Port Talbot

This monitoring station has been in operation since early January 1997. Measurements of specific pollutants and meteorological parameters are made continuously, producing an average value for every 15 minutes in the day. The National Environmental Technology Centre (NETCEN) and their contractors (Stanger Science and Environment) collect the data. The data is then subjected to a rigorous quality assurance procedure, prior to dissemination via the Internet and Ceefax. The site is initially contacted via modem and the data collected at regular intervals. Data is automatically scaled in accordance with the latest calibrations (where appropriate) and subjected to an initial inspection prior to dissemination within one hour of receipt. Subsequently, data remains in this format until a final ratification is carried out, by NETCEN, normally in three-month blocks. Some care should therefore be exercised when relying upon statistics not yet subject to final ratification. All data for 2000 has now been fully ratified and can therefore be reported with confidence. Data is collected in respect of PM_{10} particulates, oxides of nitrogen (NO_x), sulphur dioxide (SO_2) and ozone (O_3). Also, carbon monoxide (CO) measurements have been taking place since mid May 1998. The carbon monoxide data is not currently part of the national network, but it is hoped that it will be adopted at some point in the future. In addition, this authority can also retrieve wind speed and direction data from the site, which is collected via sensors located on top of a 10-metre mast, attached to the cabin. The location of the analyser is shown in Figure 53.

Pollutants monitored

PM_{10}

PM_{10} describes the fraction of airborne particulate matter that is less than 10 microns in size. Fine particles are of the greatest concern since they are capable of being easily transported over long distances on currents of air. Also, fine particles may be drawn into the respiratory air-ways where they may adversely affect health. Recently, the attention of scientists has been drawn towards studying the $PM_{2.5}$ fraction and even smaller particles that can penetrate the very deepest parts of the lung.

PM_{10} and other particulate matter may vary considerably in chemical and physical composition. Particles (and other forms of pollution) may be described as ‘primary’ or ‘secondary’ according to their source. Secondary pollution arises as a result of the chemical reaction (or interaction) of pollutants in the atmosphere. Examples of secondary pollution include acid rain, ozone and significant quantities of sulphate particles. On the other hand, primary pollutants arise directly from the polluting source. The principal sources of ‘primary’ polluting particles are combustion processes e.g. traffic and industry.

Sulphur Dioxide (SO_2)

Sulphur dioxide is a corrosive acid gas that combines with water vapour in the atmosphere to produce acid rain. SO_2 in ambient air is capable of causing harm to human health and the environment. It is associated with asthma and

chronic bronchitis, and has been known to damage vegetation, soils, watercourses and building materials.

Sulphur dioxide is mainly formed as a result of the combustion of fossil fuels in power stations. Some areas, which rely heavily upon the use of coal for domestic heating may suffer localised pollution as a consequence.

Nitrogen Dioxide (NO_2)

Nitrogen dioxide is one of a number of nitrogen oxides that are formed during high temperature combustion processes from the oxidation of nitrogen in the air or fuel. Road traffic is the main source, being the cause of approximately 50% of all European emissions. Concentrations tend therefore to be highest in urban environments with high traffic levels and in the vicinity of large industrial sources.

Nitrogen dioxide is a respiratory irritant and also plays a part in production of another atmospheric pollutant, Ozone. Nitrogen oxides persist in the atmosphere for only about one day before they are oxidised to nitric acid. Nitrogen oxides therefore play a part in the production of acid rain.

Ozone (O_3)

Ozone is a highly reactive chemical which, when present in the lower atmosphere at high concentrations, can irritate the eyes and air passages, causing breathing difficulties. Ozone is a so-called secondary pollutant since it is produced indirectly by the reaction between hydrocarbons, NO_2 and sunlight. Ozone tends to be lower in urban areas because high levels of NO are produced by vehicles and this helps to break down ozone to oxygen and NO_2. The highest ozone therefore tends to occur in rural areas and during the summer months when the sun shines the longest. The ozone forming reactions are complex and have a time lag associated with them which can mean that ozone levels are greatest downwind of the location where the pollution is produced. It is recognised that low level ozone formation is an international problem and that exceedences of the National Air Quality Standard would still occur, even if all sources of hydrocarbons were eliminated in this country.

Carbon monoxide (CO)

Carbon monoxide (CO) is a toxic gas which is emitted into the atmosphere as a result of combustion processes, and is also formed by the oxidation of hydrocarbons and other organic compounds. In European urban areas, CO is produced almost entirely (90%) from road traffic emissions. In some areas, localised industrial sources may be significant. Carbon monoxide at levels found in ambient air may reduce the oxygen-carrying capacity of the blood. It survives in the atmosphere for a period of approximately 1 month but is eventually oxidised to carbon dioxide.

Results and analysis

Appendix 1 shows the UK air quality standards and bandings. Table 15 shows the objectives of the UK National Air Quality Strategy, whereas Table 16 shows the air quality bands. The results for each of the pollutants should be read in the context of these tables.

Meteorological data

Figure 39 shows the average proportion of the time in percent that the wind blows from any of the 16 specified compass points. The average wind speed for these directions are also shown.

Nitrogen dioxide (NO_2)

The results are summarised in Table 8. Figure 40 shows time series graphs of NO_2 concentration for each month expressed as hourly averages.

Limits and objectives

The National Air Quality Objective is defined in two ways. The first method of assessment is based upon exceedence of 105ppb or 200μg/m^3 as an hourly average, with 18 exceedences being allowed per year, to be achieved by 31st December 2005. The second method specifies an annual average of 21ppb or 40μg/m^3 as the limit. The maximum hourly value was 50ppb and the annual average was 11ppb. Therefore, no exceedences of the Air Quality Objective level occurred. No exceedences of the World Health Organisation (WHO) guideline (hourly average > 110ppb) occurred. Air pollution levels were "low" at all times. The EU Directive (98 percentile >104.6) was not breached.

Directional analysis

Average nitrogen dioxide levels have been analysed by wind direction (Figure 41). Levels were highest from a generally northerly direction, the maximum being 15 ppb from the north-north west. Levels from the south and west were lowest.

Summary

There were no exceedences of the Air Quality objective level for NO_2 during 2001, as was the case in previous years.

Sulphur dioxide (SO_2)

The results are summarised in Table 10. Figure 42 shows the time series graphs for SO_2 concentration for each month expressed as hourly averages.

Limits and objectives

The Air Quality objective level (100ppb or 266μg/m^3 as a 15-minute average) was not breached during 2001, therefore the Air Quality Objective, which is based upon the 99.9 percentile of all 15-minute average values, was not breached. The maximum 15-minute average was 88ppb. The maximum daily average was 19ppb and neither the Air Quality Objective (daily average 47 ppb or 125μg/m^3 not to be exceeded more than 3 times per year) or the EU Directive (daily average >38) were breached. The Air Quality Objective also has an hourly averaged limit, which is 132ppb or 350μg/m^3, not to be breached more than 24 times a year, was not breached. The maximum hourly average was 54ppb. The WHO guideline (hourly average > 122ppb) was not breached. Air pollution was low throughout the year.

Directional analysis

SO_2 levels (Figure 44, Table 9) were generally greatest from the south-western quadrant, peaking at 9 ppb in the west-south-west.

Summary

The Air Quality Objective level was not breached during 2001.

Ozone (O_3)

The results are summarised in Table 11. Figure 45 shows the time series graphs for O_3 concentration for each month expressed as hourly averages.

Limits and objectives

The Air Quality strategy has recommended a non-statutory objective at 50ppb, as a rolling 8hour average. This was breached on a total of 79 occasions on a total of 21 days. All exceedences occurred between the months of April and July. No statutory Air Quality Objective level for Ozone has been set, owing to the potential for trans-boundary sources. Air pollution was low apart from 152 hours of 'moderate' and two hours of high pollution. The WHO guideline was breached on 38 occasions and is based on a rolling 8hour average 60ppb level.

Directional analysis

O_3 levels were not particularly direction dependent (see figure 46), but were slightly biased to the south and west. Lowest averages were typically in the north.

Summary

In 2001 there were 79 of breaches of the Air quality strategy recommended objective for Ozone. This is an improvement over the result obtained in 2000, where 130 breaches occurred.

PM_{10}

The results are summarised in Table 12. Figure 47 shows the time series graphs for PM_{10} concentration for each month expressed as 24hour running averages.

Limits and objectives

The average concentration was 23 $\mu g/m^3$, whilst the hourly maximum was 296 $\mu g/m^3$ (during April). The Air Quality Objective level is 50 $\mu g/m^3$ as a gravimetric daily average to be breached no more than 35 occasions in a year. Since gravimetric methods typically produce higher values than TEOM's, a factor must be applied to the TEOM data for equivalence. The current recommended factor is TEOM X 1.3, although work is ongoing to establish a more accurate factor for Port Talbot. Using this method, there were 39 days in 2001 where the daily averages exceeded 50 $\mu g/m^3$. Consequently the Air Quality Objective Level, which is to be achieved by 31st December 2004, was breached. Air pollution was 'high' for 52 hours, 'moderate' for 390 hours and 'low' 8051 hours.

Directional analysis

Figure 48 shows that PM_{10} levels were once again highest from the west south-west (57 $\mu g/m^3$).

Summary

The Air Quality Objective level was breached again during 2001. However, the number of exceedences, at 39 days was only a little more than the 35 days allowed. The decrease in the number of exceedences may in part be due blast furnace number 5 being out of order at the Corus steel works during November and December. But the number of exceedences was still relatively low even when this factor is taken into consideration. The issue of PM_{10} pollution is being tackled as part of the Air Quality Strategy and the Air Quality Management Action Plan.

Carbon monoxide (CO)

The results are summarised in Table 13. Figure 49 shows the time series graphs for CO concentration for each month expressed as hourly averages.

Limits and objectives

The Air Quality Objective level (10ppm expressed as an 8hour rolling average) was not exceeded. The World Health Organisation has set two guidelines for CO. One guideline is identical to the Air Quality Objective, and was therefore not exceeded. The second guideline equates to 25 ppm as an hourly average. This guideline was not exceeded, since the maximum hourly average was 22 ppm.

Directional analysis

Figure 50 shows that average CO concentrations showed a pronounced bias towards the south westerly direction (1.2 ppm).

Summary

There was no breach of the Air Objective level during 2001.

Discussion

The number of PM_{10} exceedences during 2001 was significantly lower than during 2000. This may in part relate to the non-operation of Blast Furnace Number 5 at the Corus works during the last two months of the year. But exceedences were still less than expected. Nonetheless, the Air Quality Objective level was still breached during 2001.

Table 8 Nitrogen dioxide summary statistics 2001

Statistic	Definition	Month												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Hours Very High	300+ (ppb)	0	0	0	0	0	0	0	0	0	0	0	0	0
Hours High	100-299 (ppb)	0	0	0	0	0	0	0	0	0	0	0	0	0
Hours Moderate	50-99 (ppb)	0	0	0	0	0	0	0	0	0	0	0	0	0
Hours Low	0-49 (ppb)	740	526	690	668	697	719	741	686	717	742	716	727	8369
Exceedences of NAQS objective level	Hourly mean >105 ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Max 15-min		47	54	46	45	55	55	49	39	50	36	43	61	61
Max (hr)		45	48	40	42	41	33	43	34	43	35	40	50	50
Max (8Hr)		36	42	29	25	33	23	34	23	34	23	33	39	42
Max (24Hr rolling)		35	37	24	18	27	18	27	19	26	19	28	35	37
99% daily max 24hr rolling		35	37	24	18	27	18	27	19	26	19	28	35	31
Max (day)		31	32	21	16	25	17	26	17	25	17	27	33	33
Average		15	15	11	9	12	9	9	8	10	10	14	14	11
Data Capture (%)		99	78	93	93	94	100	100	92	100	100	99	98	96

Table 9 Average PM_{10}, NO_2, SO_2, O_3 and CO levels by direction 2001

Direction	PM_{10} (ug/M3)	NO_2 (ppb)	SO_2 (ppb)	O_3 (ppb)	CO (ppm)
N	13	14	2	19	0.27
NNE	14	13	2	19	0.30
NE	15	13	2	19	0.35
ENE	15	14	3	21	0.35
E	15	14	4	22	0.33
ESE	15	13	3	24	0.36
SE	20	13	3	25	0.32
SSE	26	12	5	26	0.33
S	36	11	7	29	0.39
SSW	34	7	3	33	0.52
SW	43	6	6	32	1.24
WSW	57	9	9	29	1.16
W	29	7	4	30	0.35
WNW	18	9	2	26	0.31
NW	14	12	1	21	0.25
NNW	12	15	2	19	0.27

Table 10 Sulphur dioxide summary statistics 2001

Statistic	Definition	Month												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Periods Very High	15min >=400 (ppb)	0	0	0	0	0	0	0	0	0	0	0	0	0
Periods High	15min 200-399 (ppb)	0	0	0	0	0	0	0	0	0	0	0	0	0
Periods Moderate	15min 100-199(ppb)	0	0	0	0	0	0	0	0	0	0	0	0	0
Periods Low	15min <100(ppb)	2786	2613	2705	2628	2742	2817	2886	2694	2811	2904	2794	2882	33262
Exceedences of NAQS guideline	15min => 100ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Exceedences of NAQS guideline	1Hour >= 132ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Exceedences of NAQS guideline	24 Hour >= 47ppb	0	0	0	0	0	0	0	0	0	0	0	0	0
Days of NAQS exceedence		0	0	0	0	0	0	0	0	0	0	0	0	0
Max 15-min		61	64	41	56	64	45	43	62	54	88	41	51	88
Max (hr)		54	44	31	27	45	29	32	35	41	34	31	43	54
Max (8Hr)		36	18	17	19	17	17	21	15	27	17	16	23	36
Max (24Hr rolling)		24	12	8	10	10	8	10	8	18	9	7	14	24
99% daily max 24hr rolling		24	12	8	10	10	8	10	8	18	9	7	14	14
Max (day)		19	10	8	9	7	4	10	5	14	6	7	12	19
Average		3	4	3	3	4	3	3	2	3	3	2	3	3
Data Capture (% hourly)		96	99	93	93	94	100	99	92	100	100	99	99	97

Table 11 Ozone summary statistics 2001

Statistic	Definition	Month												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Hours Very High	>=180 (ppb) hourly	0	0	0	0	0	0	0	0	0	0	0	0	0
Hours High	90-179 (ppb) hourly	0	0	0	0	0	2	0	0	0	0	0	0	2
Hours Moderate	50-89(ppb) hourly	0	0	0	8	61	53	30	0	0	0	0	0	152
Hours Low	<50 (ppb)	744	671	694	665	654	665	714	693	720	744	720	737	8421
Exceedences of EPAQS guideline	Running 8hr average > 50ppb	0	0	0	0	30	39	10	0	0	0	0	0	79
Exceedences of WHO guideline	Running 8hr average > 60ppb	0	0	0	0	8	28	2	0	0	0	0	0	38
Max 15-min		49	46	52	54	78	96	75	50	63	49	45	41	96
Max (hr)		47	45	49	53	77	93	74	49	49	48	45	39	93
Max (8Hr)		40	40	46	50	66	78	61	35	43	47	42	38	78
Max (24Hr rolling)		37	36	40	44	59	71	51	31	39	39	36	36	71
99% daily max 24hr rolling		37	36	40	44	59	71	51	31	39	39	36	36	50
Max (day)		36	36	39	44	51	64	41	30	38	39	36	35	64
Average		21	21	28	34	33	30	25	22	23	27	19	19	25
Data Capture (%)		100	99	93	93	95	100	100	92	100	100	99	99	97

Table 12 PM10 summary statistics 2001

Statistic	Definition	Month												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Hours Very High	>=100 ug/m3, 24hr running average	0	0	0	0	0	0	0	0	0	0	0	0	0
Hours High	75-99 ug/m3, 24hr running average	0	0	0	23	0	0	29	0	0	0	0	0	52
Hours Moderate	50-74 ug/m3, 24hr running average	8	34	37	27	42	16	115	0	0	111	0	0	390
Hours Low	<50 ug/m3, 24hr running average	736	638	707	611	660	620	600	682	720	633	720	724	8051
Exceedences of NAQS guideline	>=50 ug/m3, 24hr average	1	4	2	5	7	4	7	0	0	8	1	0	39
Max 15-min		225	189	240	387	201	360	276	210	191	491	317	132	491
Max (hr)		130	138	137	296	142	189	213	155	124	228	236	62	296
Max (8Hr)		68	74	94	184	108	107	177	70	62	116	85	51	184
Max (24Hr rolling)		52	58	62	99	64	57	91	47	43	74	42	37	99
99% daily max 24hr rolling		52	58	62	99	64	57	91	47	43	74	42	37	82
90% (Day)		30	40	36	44	41	43	59	31	31	52	41	20	40
Max (day)		46	57	60	82	61	57	88	38	37	73	41	34	88
Average		20	24	21	25	28	26	31	22	19	30	17	14	23
Data Capture (%)		99	99	100	93	94	90	100	93	100	100	99	99	97

Table 13 Carbon monoxide summary statistics 2001

Statistic	Definition	Month												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Hours Very High	>=20 (ppm) hourly	0	0	0	0	0	0	0	0	0	0	0	0	0
Hours High	15-19 (ppm) hourly	0	0	0	0	0	0	0	0	0	0	0	0	0
Hours Moderate	10-14(ppm) hourly	0	0	0	0	0	0	0	0	0	0	0	0	0
Hours Low	<10 (ppm) 8 hr rolling	711	644	350	473	558	455	729	562	619	697	697	629	7175
Exceedences of NAQS guideline	Running 8hr average > 10ppm	0	0	0	0	0	0	0	0	0	0	0	0	0
Days of NAQS exceedence		0	0	0	0	0	0	0	0	0	0	0	0	0
Exceedences of WHO guideline	hr > 25ppm	0	0	0	0	0	0	0	0	0	0	0	0	0
Max 15-min		12	4	42	13	8	11	22	4	4	11	5	5	42
Max (hr)		4	3	22	5	5	4	16	3	2	6	3	2	22
Max (8Hr)		2	1	4	3	2	2	4	2	2	3	1	1	4
Average		0.4	0.5	0.9	0.4	0.5	0.6	0.5	0.5	0.3	0.4	0.3	0.3	0.4
Data Capture (%)		96	98	49	69	78	67	99	80	89	95	98	88	84

Figure 39 Wind speed and direction: 2001

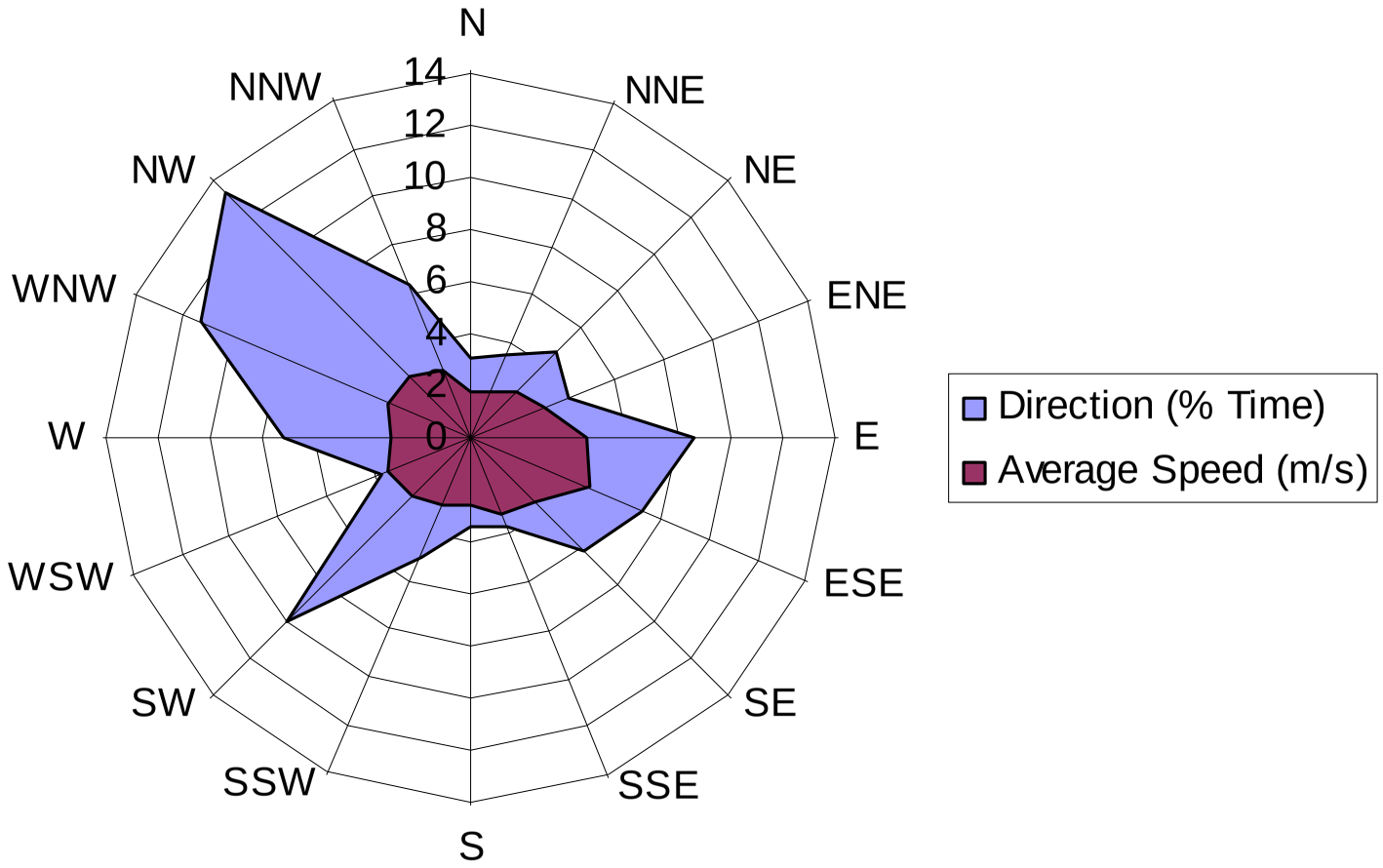


Figure 40 Nitrogen dioxide results – 2001 - hourly averages

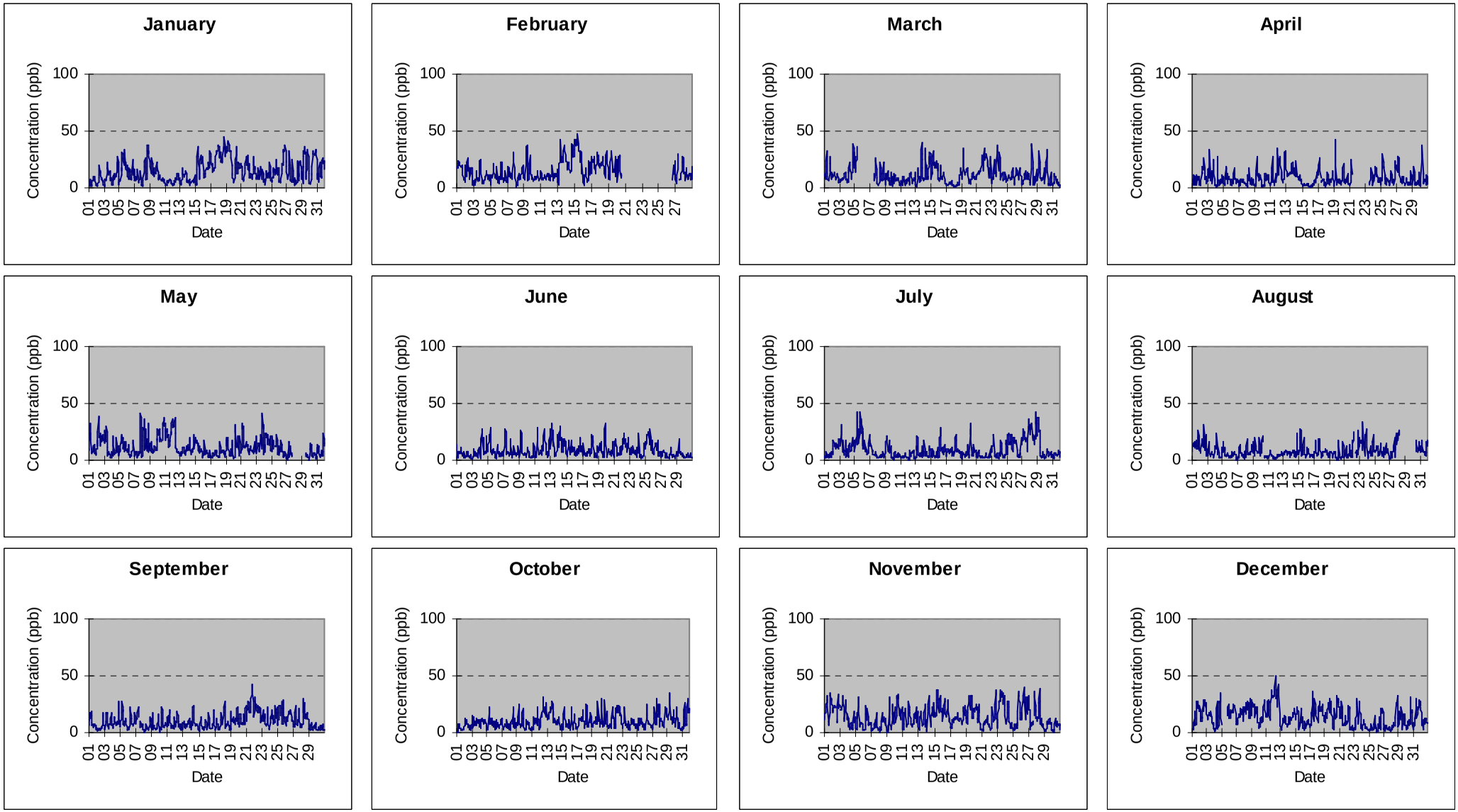


Figure 41 Average nitrogen dioxide levels by wind direction

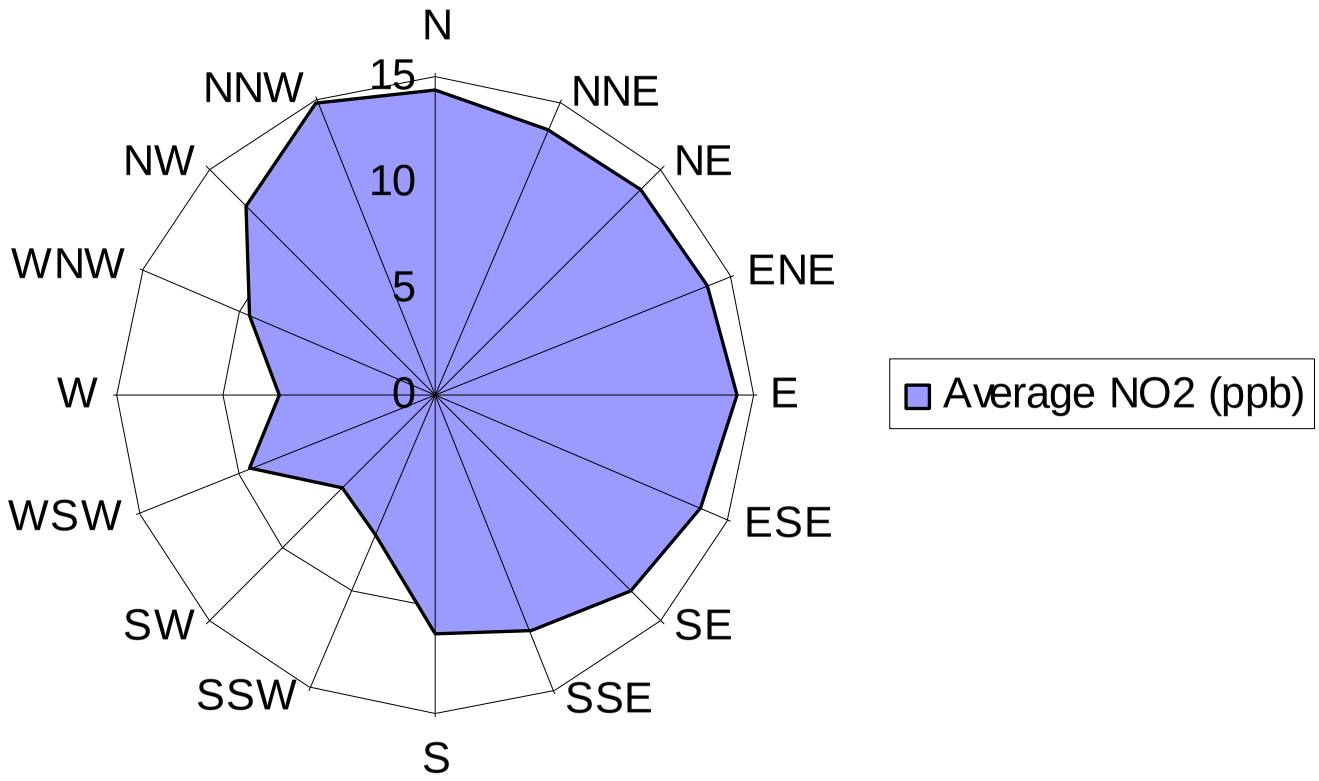


Figure 42 Sulphur dioxide results – 2001 – 15minute averages

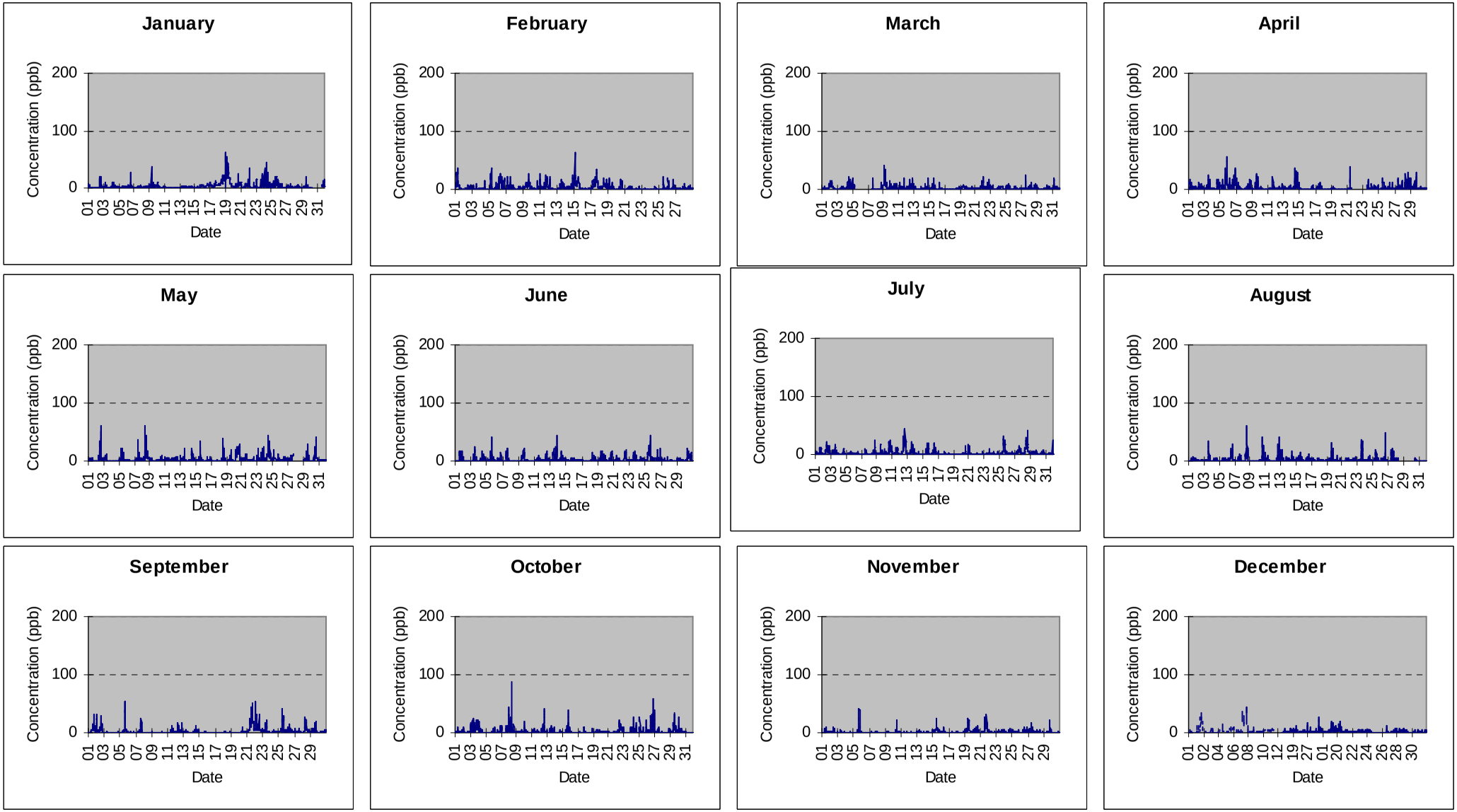


Figure 44 Average sulphur dioxide levels by wind direction

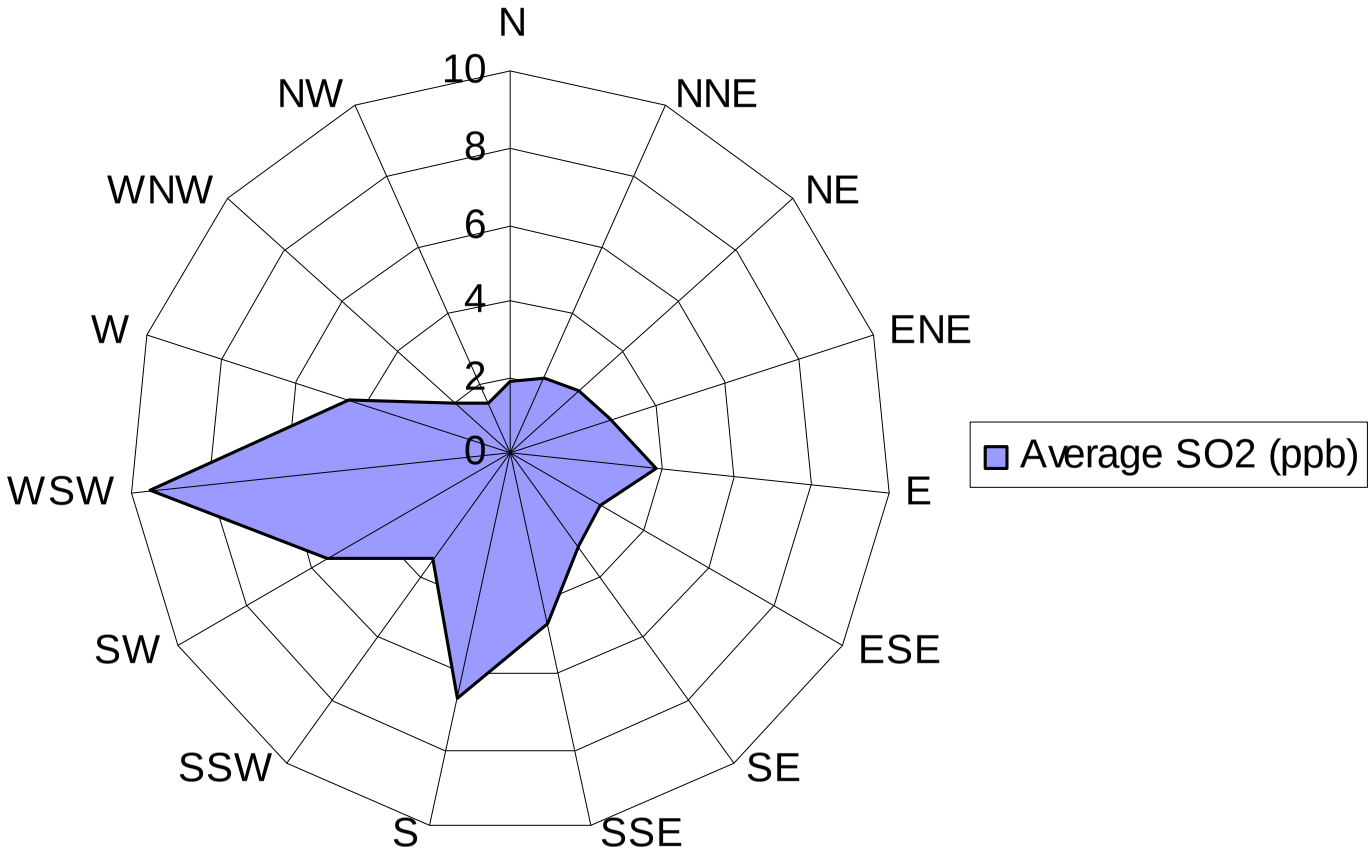


Figure 45 Ozone results – 2001 – 8hour running averages

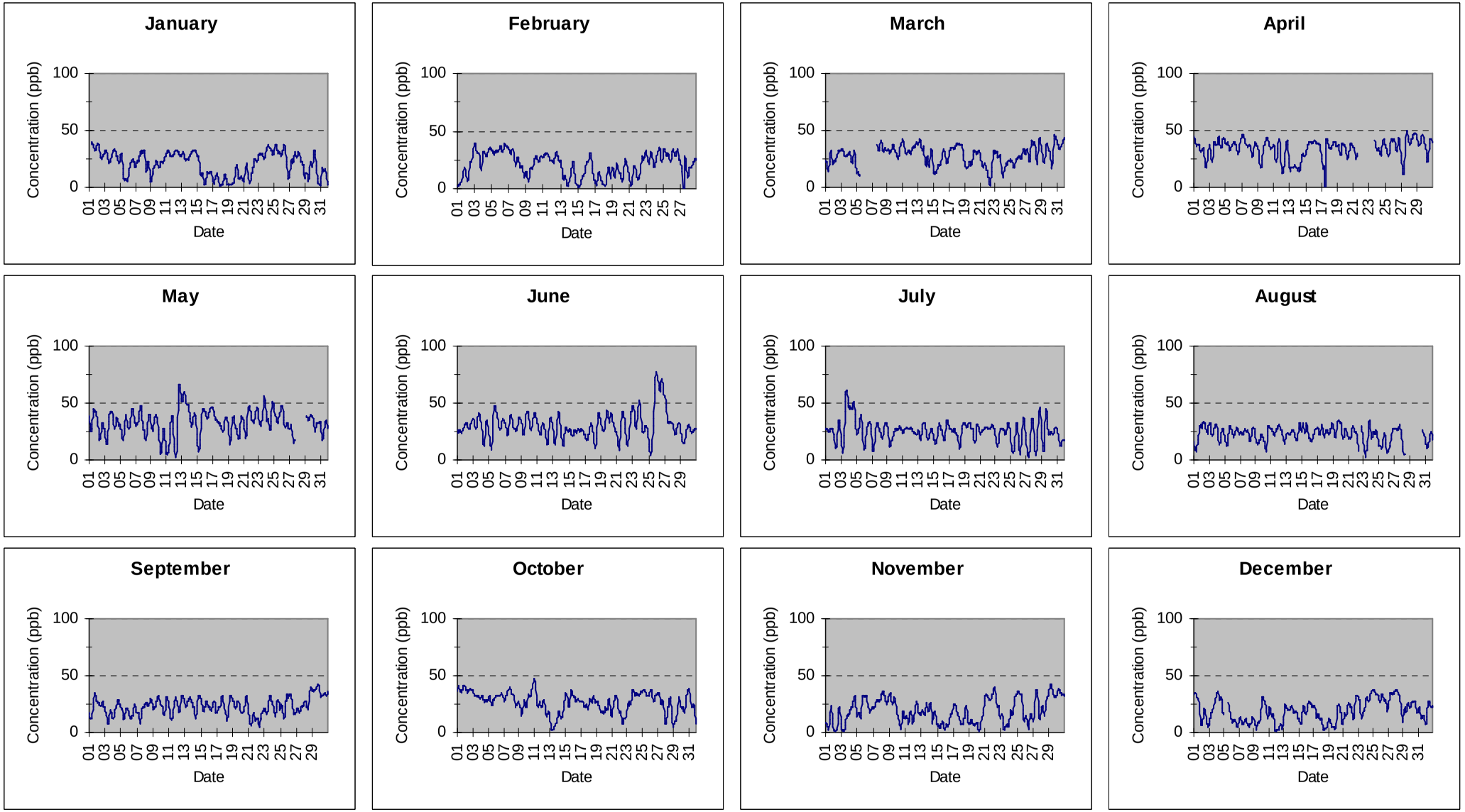


Figure 46 Average ozone levels by wind direction

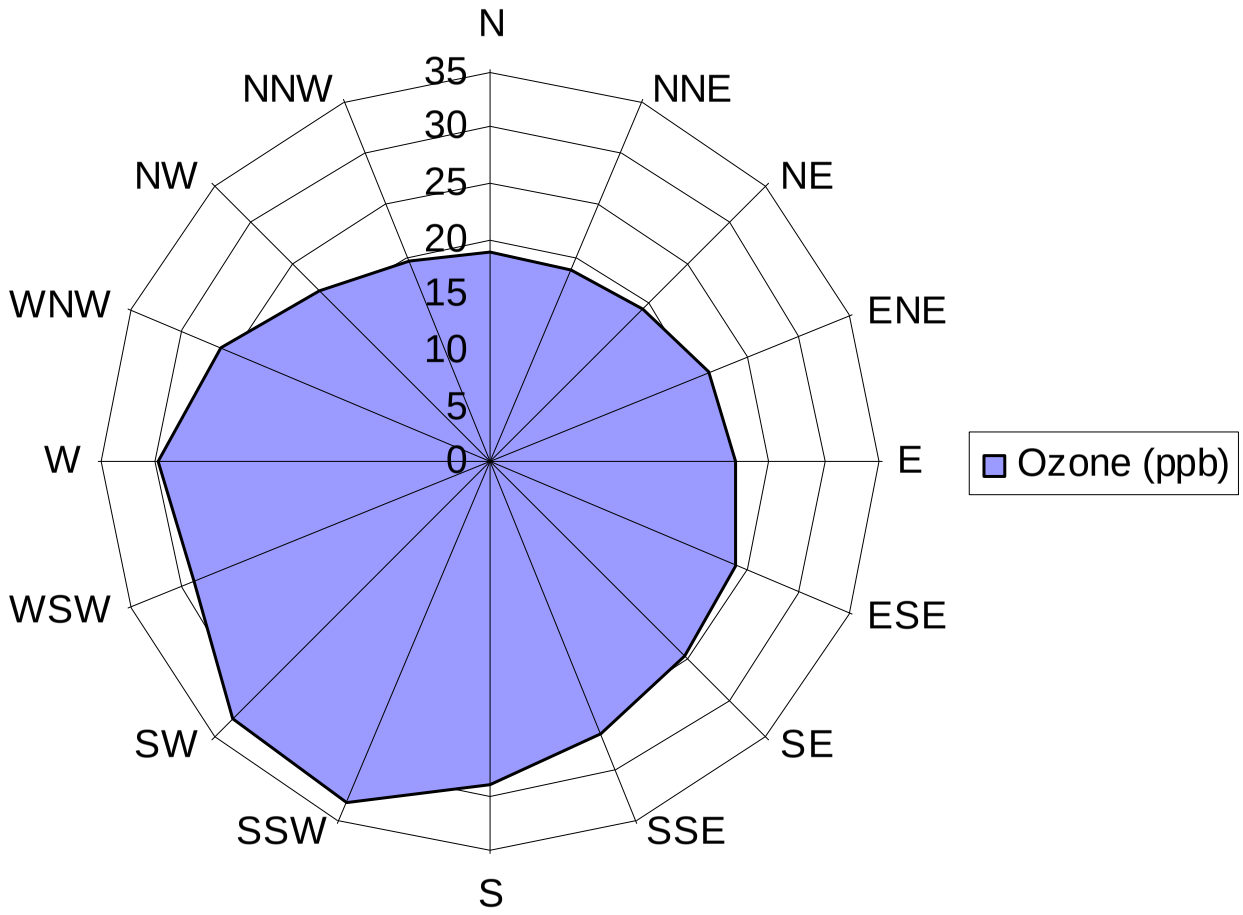


Figure 47 PM_{10} results – 2001 - 24hour running averages

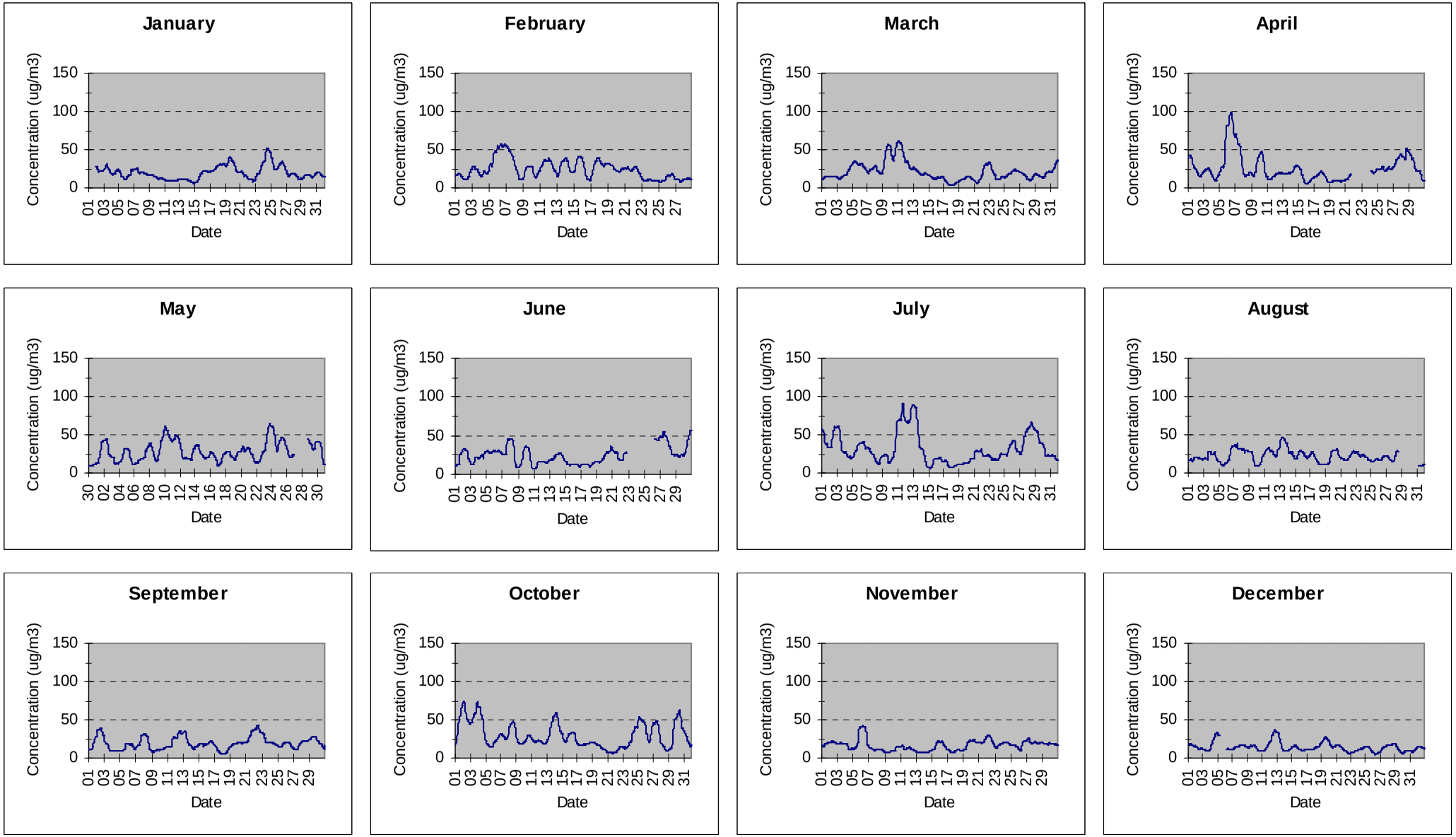


Figure 48 PM_{10} particulate levels by wind direction

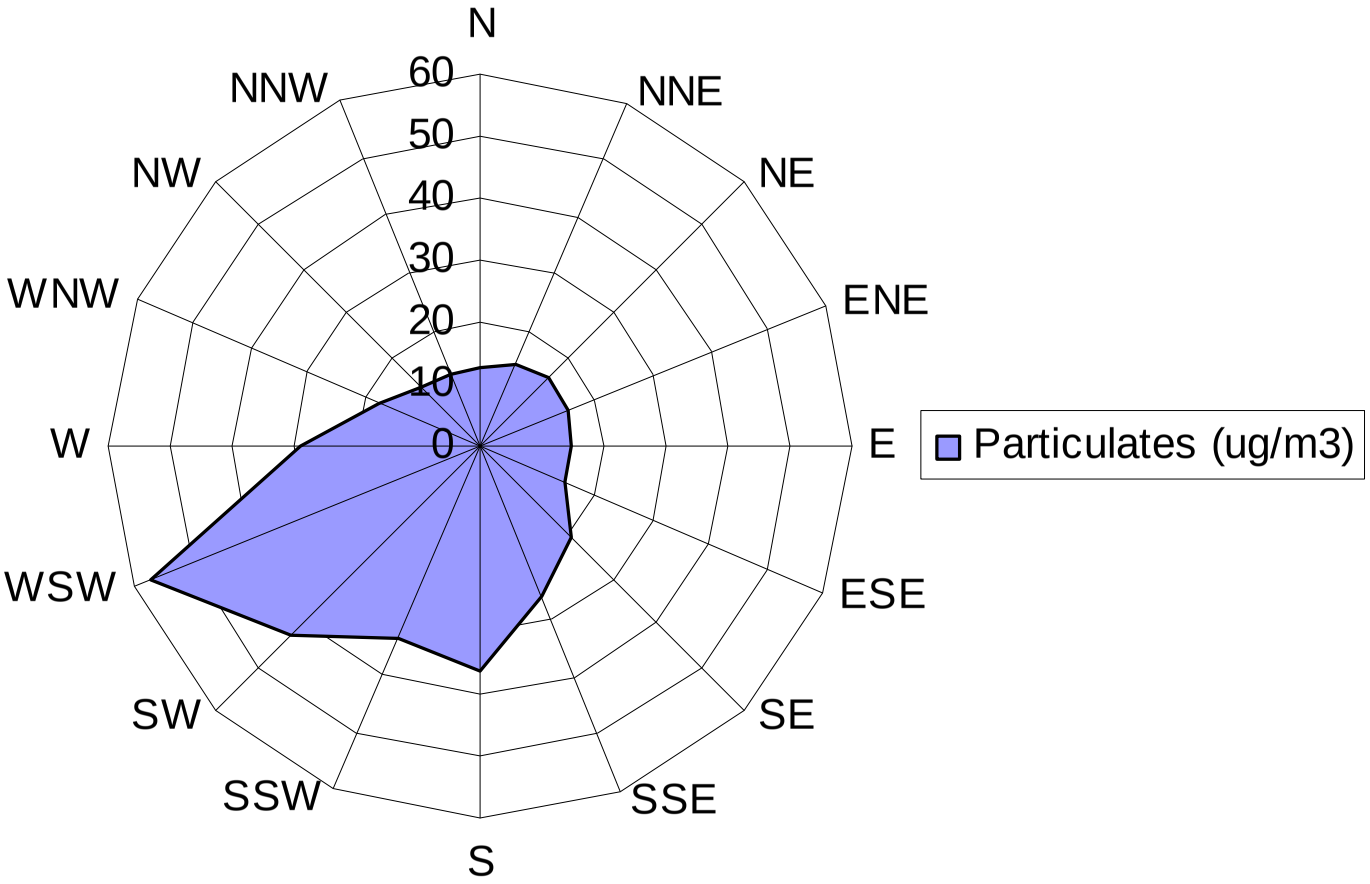


Figure 49 CO results – 2001 - 8hour running averages

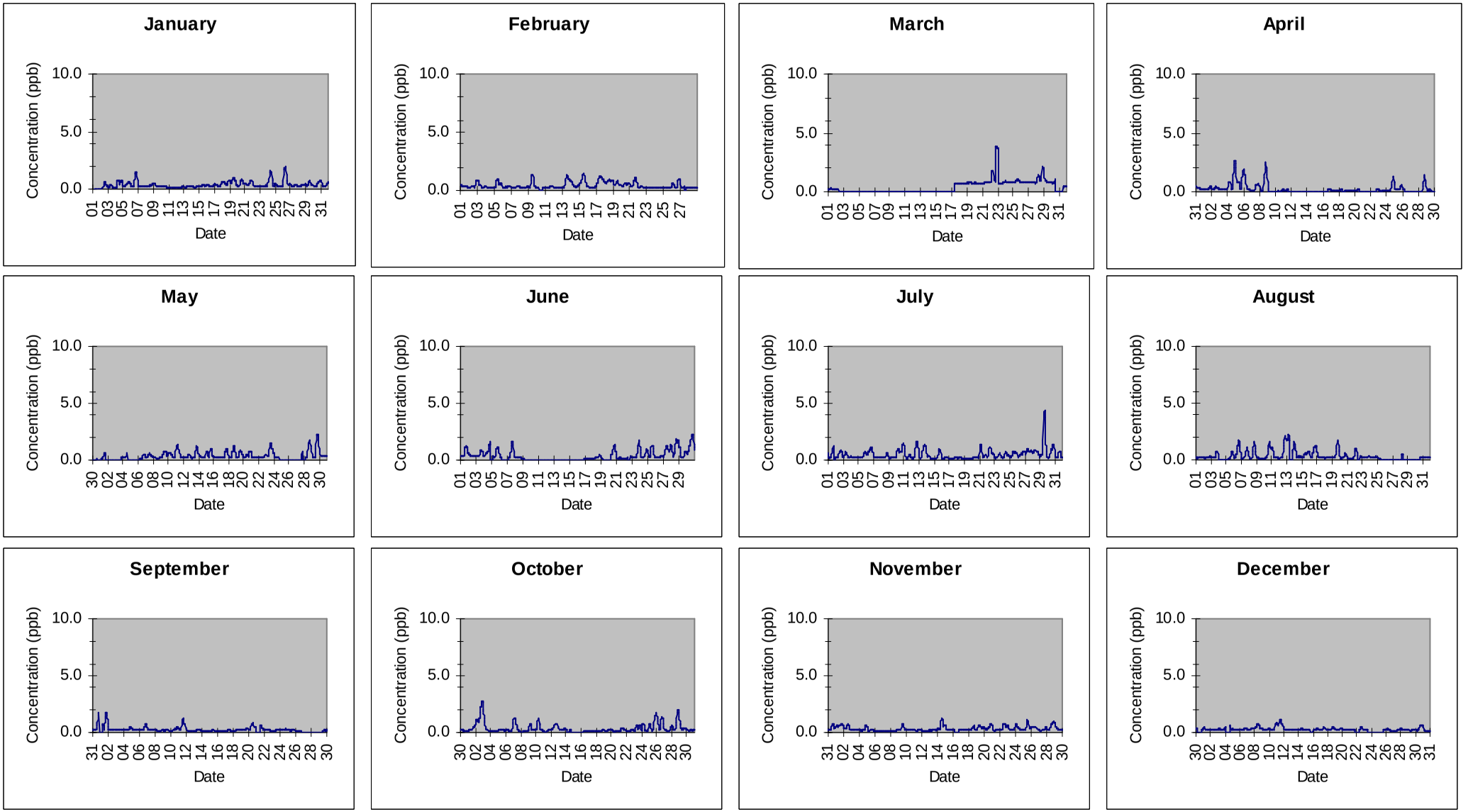
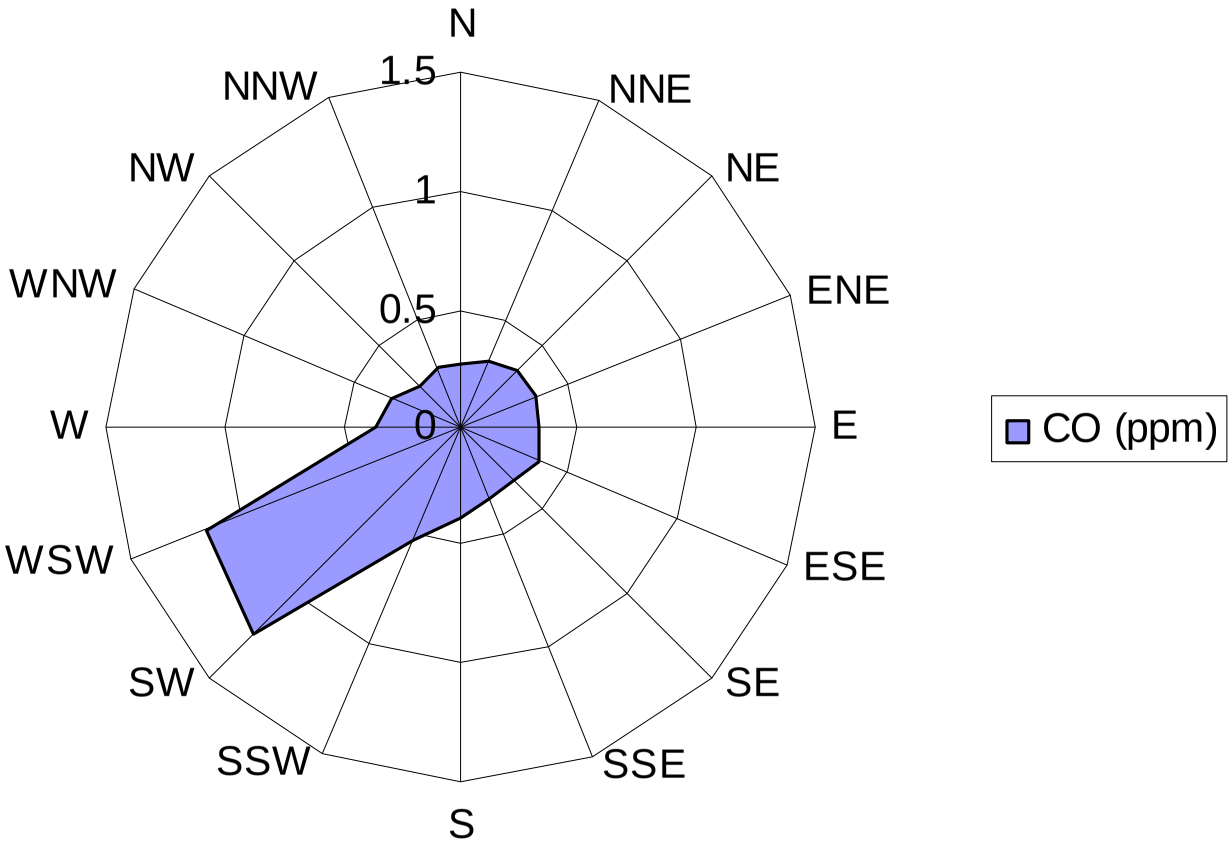


Figure 50 CO levels by wind direction



Organics –Ozone Precursor System
Baglan, Port Talbot

Introduction

This monitoring station has been in operation since November 1996. Neath Port Talbot and Swansea Authorities were successful in obtaining funding from the Department of the Environment (now Department of the Environment, Transport and the Regions) to pilot the government's proposals for Local Authority air quality management under the Environment Act. Part of this award was used to provide the Monitoring Unit. The total cost of setting up the unit was approximately £50,000. In April 1998, the system was incorporated onto the Authority's Monnet database, which allows remote data collection and quality assurance. The data is checked on a daily basis and is collected and disseminated to the Authority's World Wide Web Internet site on an hourly basis. The location of the analyser is shown in Figure 53.

Pollutants monitored

The ozone precursor analyser is so called because it allows measurement of volatile organic compounds (VOC's), substances that have a role in the formation of another pollutant, Ozone. Ozone in turn is of concern since it can cause harm plants and people when present at low altitude and in high concentrations. VOC is an acronym, which stands for Volatile Organic Compounds. These are a range of mainly synthetic, carbon based substances which are capable of becoming a vapour at relatively low temperatures. These substances are primarily man-made, but Methane also arises naturally from the putrefaction of organic materials and as a result of the process of digestion in animals. Some VOC's are recognised as being potentially harmful to health, whereas others are harmful to the environment. The government has introduced National Air Quality Objectives (1997), which are health based environmental aims, for Benzene and 1,3-Butadiene, to be achieved by 31st December 2003. These measurements do not currently contribute to the National Hydrocarbon Network, but it is hoped that they may in future be incorporated.

The following volatile organic compounds are analysed:

- 1,3-butadiene
- 1-butene
- 3 methyl pentane
- Benzene
- Ethane
- Ethene
- Ethyl benzene
- Ethyne
- Propane
- Propene
- Toluene

- Cis 2-Butene
- Cis 2-pentene
- Iso-butane
- Iso-pentane
- m+p-xylene
- o-xylene
- N-Butane
- N-heptane
- N-hexane
- N-pentane
- Trans 2 butene
- Trans 2 pentene

Apart from benzene and 1,3-butadiene, there are no environmental standards that apply for these pollutants and adverse health effects are unlikely to arise at ambient concentrations.

Benzene

Benzene is a chemical consisting of six atoms of carbon and hydrogen, arranged in a ring structure. Benzene in the atmosphere arises primarily as a result of the combustion of petroleum based fuels. It is also present in cigarette smoke. Benzene harms animals by causing damage to the genetic make-up of cells. Substances that cause this type of damage are of particular concern, since there is no method currently available which enables a risk free exposure level to be determined. Long term exposure to benzene is associated with types of leukaemia. The National Air Quality Objective level is 5 parts per billion (ppb), measured as a running annual average, to be achieved by 31st December 2003.

1,3-butadiene

1,3-Butadiene is a chemical consisting of four carbon and six hydrogen atoms. Only trace amounts are normally present in the atmosphere, which arise mainly from the combustion of petroleum (and other fossil fuels) and as result of accidental fires. Like Benzene, 1,3-Butadiene is genotoxic and is associated with leukaemia's and lymphomas. The National Air Quality Objective level is 1 ppb measured as an annual running average, to be attained by 31st December 2003.

Results and analysis

The results for 2001 at Baglan and the National Hydrocarbon Network site at Cardiff are summarised and compared in Table 15 below. The Cardiff site is used since it is the nearest such site where similar measurements are carried out.

Table 14 VOC results at Baglan and Cardiff - 2001

VOC Species	Average (ppb)		Max (ppb)	
	Baglan	Cardiff	Baglan	Cardiff
1,3-butadiene	0.03	0.17	0.66	1.78
1-butene	0.06	0.23	1.16	2.14
3-methyl pentane	0.16	ND	3.52	ND
Benzene	0.26	0.65	28.46	6.14
Ethane	3.24	7.37	30.01	58.5
Ethene	11.30	4.29	1051.08	46.19
Ethyl benzene	0.10	0.44	1.89	3.51
Ethyne	0.85	ND	21.48	ND
Propane	1.58	ND	37.64	ND
Propene	1.87	ND	148.77	ND
Toluene	0.53	ND	13.00	ND
cis 2-butene	0.05	0.13	3.05	1.3
cis 2-pentene	0.03	0.07	0.51	0.68
iso-pentane	0.52	2.38	13.69	20.92
Isobutane	0.49	ND	11.38	ND
m-xylene	0.27	0.98	40.54	9.39
o-xylene	0.11	0.27	2.45	2.89
n-butane	1.10	3.65	43.57	39.57
n-heptane	0.06	0.13	7.30	3.67
n-hexane	0.12	0.32	2.76	3.1
n-pentane	0.13	0.98	3.16	11.03
trans 2-butene	0.11	ND	1.86	ND
trans 2-pentene	0.05	ND	0.82	ND

The information is represented graphically in Figures 51 (averages) and 52 (maxima).

The average annual concentration of benzene at 0.26ppb is less than 1/10th of the National Air Quality objective level and less than half that measured in Cardiff during the same period. The 1,3-butadiene concentrations were lower, both in absolute and comparative terms. The relatively low levels with comparison to Cardiff probably reflect the difference between the urban city environment and that found at Baglan.

The majority of the other substances measured were also of lower average concentration than that found in Cardiff. The only exception was ethene (ethylene). Average ethene levels at Baglan (11.3ppb) are elevated and are approximately three times that found in Cardiff City Centre. This difference appears to be mainly due to a series of regular incidences where high ethene levels are encountered, rather than a constant high background level. This is

illustrated by a comparison of the maxima at both sites, the maximum at Baglan (1051.08) being 22 times that at Cardiff. However, average ethylene concentrations in 2001 decreased by a factor of 13% over the corresponding 2000 figure. In previous years propene has also been higher at Baglan, but no measurements were made in Cardiff during 2001. The levels of propene in 2001 at 1.87ppb were slightly higher than those experienced during 2000 (1.69ppb). The monitoring of several other substances at Cardiff also appears to have been curtailed during 2001.

The most likely source of the additional atmospheric ethene and propene is the B.P. Baglan chemical plant. Both substances are used in the production of the alcohol's ethanol and iso-propanol respectively. The process is regulated by the Environment Agency, which has been informed of the results in previous years. Following improvements in the ethylene results over the past couple of years, the usage of ethylene at B.P. Baglan was stopped during 2002.

Figure 51 VOC Average concentrations – 2001

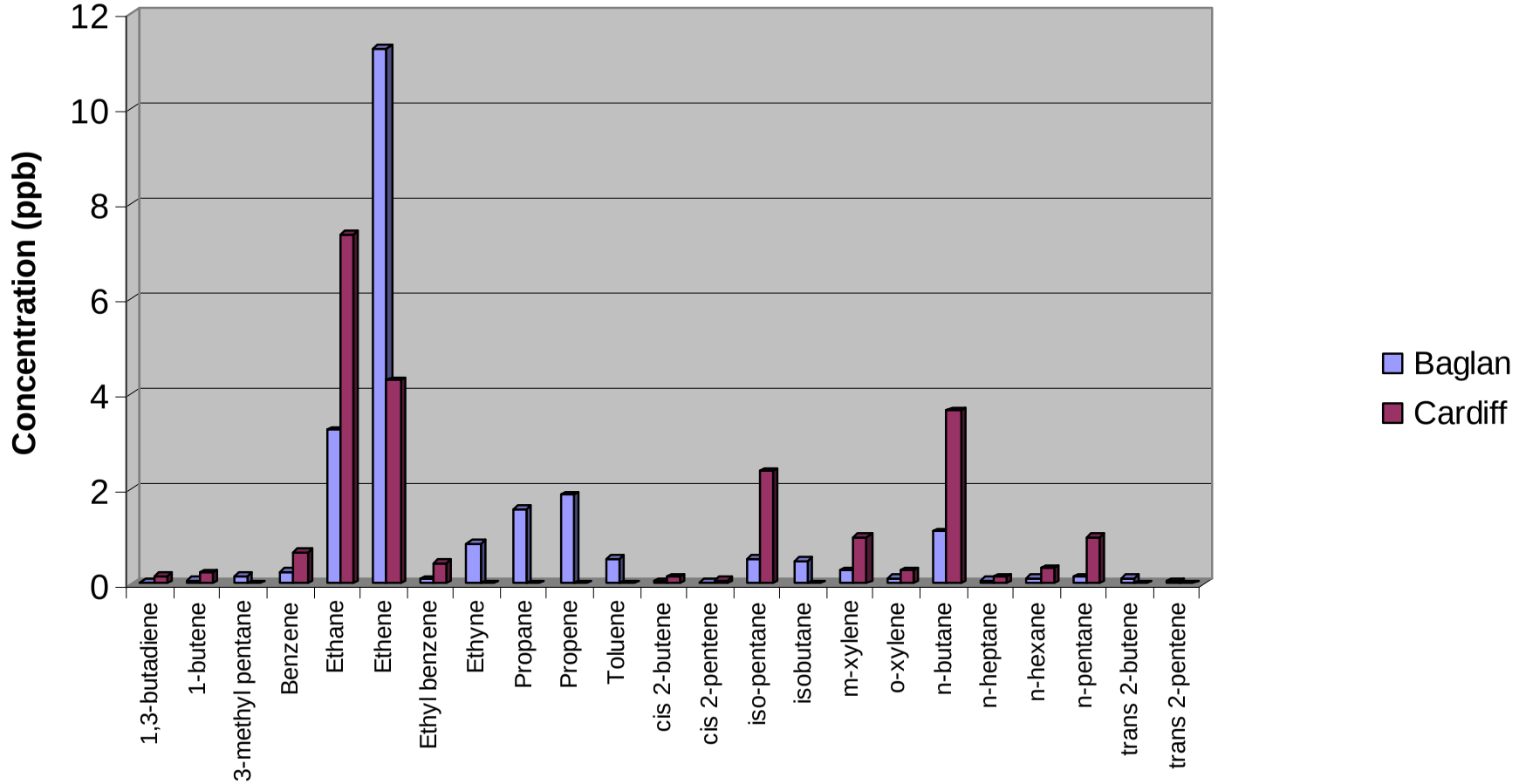


Figure 52 VOC maximum concentrations – 2001

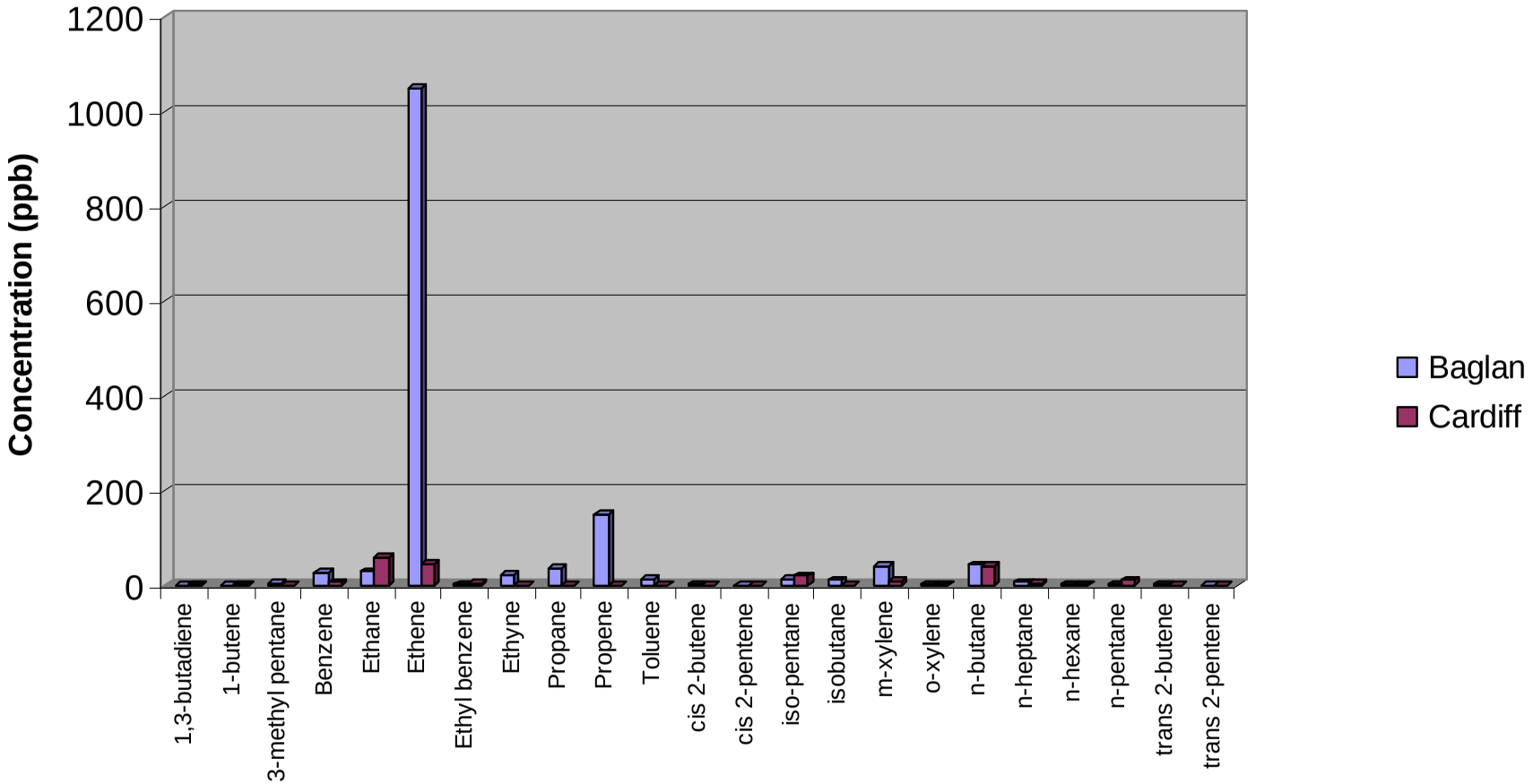
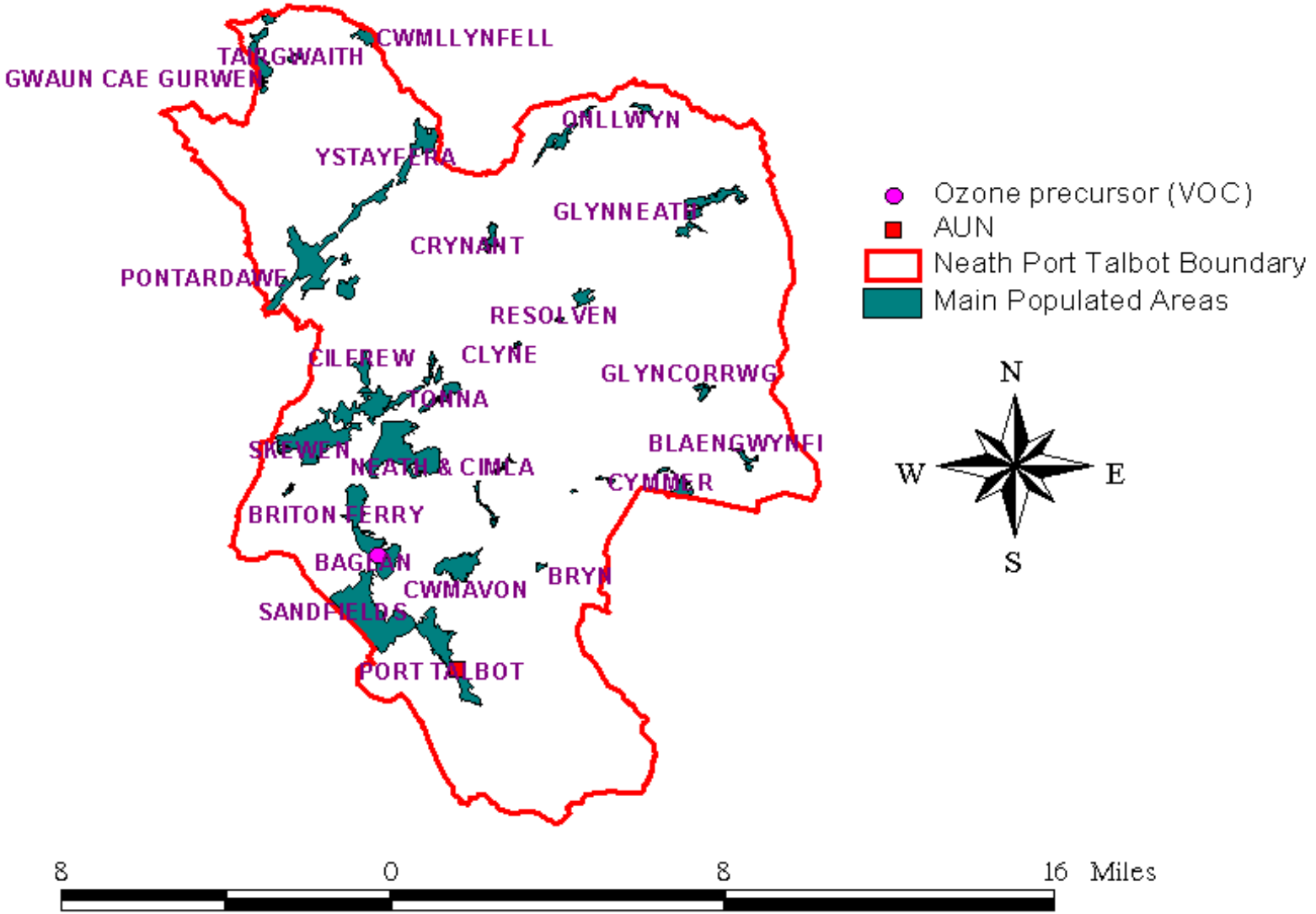


Figure 53 Continuous analyser locations



APPENDIX 1

AIR QUALITY STANDARDS AND BANDINGS

Table 15 Summary of objectives of the Air Quality (Wales) Regulations 2000

Pollutant	Standard		Objectives	Date for achievement of objective
	concentration	measured as		
Benzene	5ppb or 16.25μg/m^3	Running annual mean	• 5ppb or 16.25μg/m^3	31st December 2003
1,3-Butadiene	1ppb or 2.25μg/m^3	Running annual mean	• 1ppb or 2.25μg/m^3	31st December 2003
Carbon monoxide	10ppm or 11.6μg/m^3	running 8-hour mean	• 10ppm or 11.6μg/m^3	31st December 2003
Lead	0.25μg/m^3	Annual mean	• 0.5μg/m^3 • 0.25μg/m^3	31st December 2004 31st December 2008
Nitrogen dioxide	150ppb or 16.25μg/m^3	1 hour mean	• 150ppb or 16.25μg/m^3 (not to be exceeded more than 18 times a year)	31st December 2005
			• 21ppb or 40μg/m^3 as annual mean • **(V)**16ppb or 30μg/m^3 as annual mean	31st December 2005 31st December 2000
Ozone	50ppb or 100μg/m^3	Running 8-hour mean	• 50ppb or 100μg/m^3	31st December 2005
Fine particles (PM10)	50μg/m^3	24-hour mean	• 50μg/m^3 (not to be exceeded more than 35 times a year) • 40μg/m^3 as annual mean	31st December 2004 31st December 2004

AIR QUALITY STANDARDS AND BANDINGS (CONTD)

Sulphur dioxide	100ppb or 266μg/m^3	15 minute mean	• 100ppb or 266μg/m^3 (not to be exceeded more than 35 times a year) • 132ppb or 350μg/m^3 1-hour mean (not to be exceeded more than 24 times a year) • 47ppb or 125μg/m^3 m^3 24-hour mean (not to be exceeded more than 3 times a year) • **(V)**8ppb or 20μg/m^3 annual mean • **(V)**8ppb or 20μg/m^3 winter mean, 1st October to 31st March	31st December 2005 31st December 2004 31st December 2004 31st December 2000 31st December 2000
ppm = parts per million; ppb = parts per billion; μg/m^3 = microgrammes per cubic metre **(V)**These standards are adopted for the protection of vegetation and ecosystems. All of the remainder are for the protection of human health. This objective only applies at sites remote from identified sources, including major industry and roads and urban agglomerations, and a concentration level higher than the limit does not necessarily imply the objective has not been met.				

Table 16 UK Air quality banding levels

Band	Index	Ozone		Nitrogen Dioxide		Sulphur Dioxide		Carbon Monoxide		PM10 Particles
		8 hourly or hourly mean*		hourly mean		15 minute mean		8 hour mean		24 hour mean
		μgm^{-3}	ppb	μgm^{-3}	ppb	μgm^{-3}	ppb	mgm^{-3}	ppb	μgm^{-3}
Low										
	1	**0-32**	**0-16**	**0-95**	**0-49**	**0-88**	**0-32**	**0-3.8**	**0.0-3.2**	**0-16**
	2	**33-66**	**17-32**	**96-190**	**50-99**	**89-176**	**33-66**	**3.9-7.6**	**3.3-6.6**	**17-32**
	3	**67-99**	**33-49**	**191-286**	**100-149**	**177-265**	**67-99**	**7.7-11.5**	**6.7-9.9**	**33-49**
Moderate										
	4	**100-126**	**50-62**	**287-381**	**150-199**	**266-354**	**100-132**	**11.6-13.4**	**10.0-11.5**	**50-57**
	5	**127-152**	**63-76**	**382-476**	**200-249**	**355-442**	**133-166**	**13.5-15.4**	**11.6-13.2**	**58-66**
	6	**153-179**	**77-89**	**478-572**	**250-299**	**443-531**	**167-199**	**15.5-17.3**	**13.3-14.9**	**67-74**
High										
	7	**180-239**	**90-119**	**573-635**	**300-332**	**532-708**	**200-266**	**17.4-19.2**	**15.0-16.5**	**75-82**
	8	**240-299**	**120-149**	**363-700**	**333-366**	**709-886**	**267-332**	**19.3-21.2**	**16.6-18.2**	**83-91**
	9	**300-359**	**150-179**	**701-763**	**367-399**	**887-1063**	**333-399**	**21.3-23.1**	**18.3-19.9**	**92-99**
Very High										
	10	**360 or more**	**180 or more**	**764 or more**	**400 or more**	**1064 or more**	**400 or more**	**23.2 or more**	**20 or more**	**100 or more**

* For ozone, the maximum of the 8 hourly and hourly mean is used to calculate the index value.

Source http://www.aeat.co.uk/netcen/airqual/welcome.html

Table 17 UK Air quality banding levels

Banding	Index	Health Descriptor
Low	1	Effects are unlikely to be noticed even by individuals who know they are sensitive to air pollutants
	2	
	3	
Moderate	4	Mild effects, unlikely to require action, may be noticed amongst sensitive individuals.
	5	
	6	
High	7	Significant effects may be noticed by sensitive individuals and action to avoid or reduce these effects may be needed (e.g. reducing exposure by spending less time in polluted areas outdoors). Asthmatics will find that their 'reliever' inhaler is likely to reverse the effects on the lung.
	8	
	9	
Very High	10	The effects on sensitive individuals described for 'High' levels of pollution may worsen.

Source http://www.aeat.co.uk/netcen/airqual/welcome.html