2011

Air Quality Monitoring and Noise Control Unit Annual Report

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath

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Introduction

This annual report deals with the activities of the Air Quality Monitoring and Noise Control Unit of Dublin City Council during 2011. These activities include:

- Enforcement of air pollution control legislation
- Monitoring of environmental noise and enforcement of noise control legislation
- Environmental air quality monitoring
- Enforcement of legislation relating to control of Volatile Organic Compounds (VOC's)
- Research
- Provision of expertise on an ongoing basis to other services and departments in Dublin City Council

The areas of enforcement of air pollution and noise control legislation continued to be a challenge during 2011. Overall the number of complaints for air pollution and noise pollution remains similar to last year.

Air quality during 2011 continued to be generally good. Levels of sulphur dioxide, black smoke and carbon monoxide are well below EU limit values. Levels of nitrogen dioxide improved during 2011 compared with 2010 however, this remains a challenge in the coming years.

Investigation of complaints made by the public in relation to air quality and noise is a major element of the Unit's work. In 2011, 115 air pollution complaints and 447 noise complaints were investigated.

Air Pollution complaints

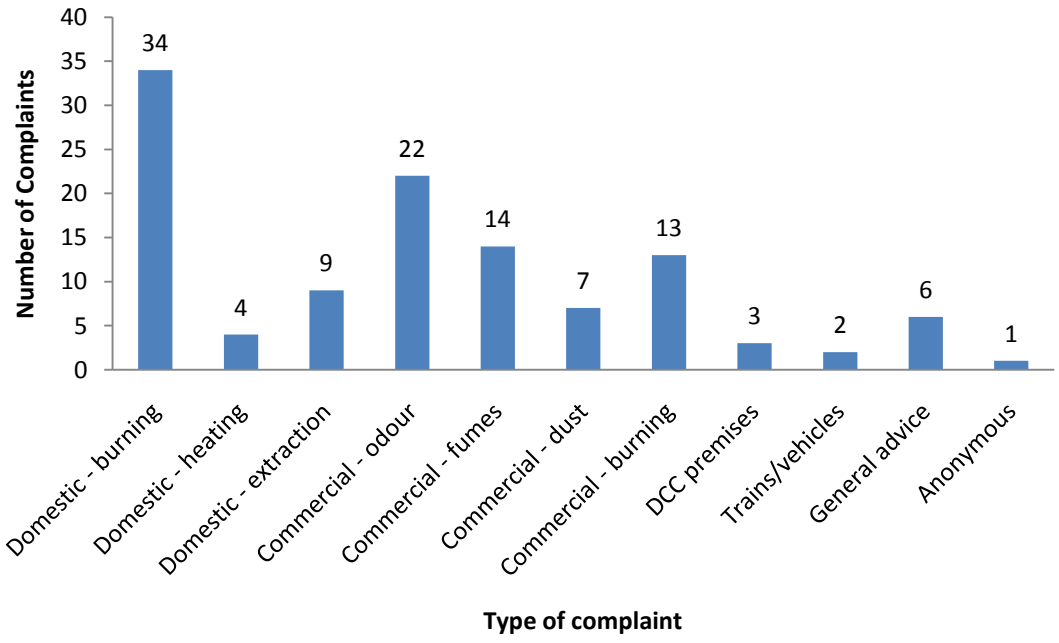
The Unit investigates complaints made by members of the public aggrieved by ongoing air pollution issues or once-off air pollution incidents. Common sources of complaint are odours caused by restaurants or food premises, emissions from commercial premises and neighbours carrying out backyard burning.

Each complaint is dealt with individually, and in a lot of cases, working in tandem with the commercial premises allows the situation to be remedied to the satisfaction of the complainant.

Where nuisance has been established and persists, despite the involvement of this Unit, a notice may be served under Section 26 of the Air Pollution Act 1987. Non-compliance with the notice can lead to court proceedings but in the majority of cases this proves unnecessary.

There were 115 complaints recorded by the Unit in 2011, almost identical to the number in 2010. Figure 1, below, shows that the most common types of complaint received by the Unit relate to domestic burning, commercial odour issues and commercial fumes.

Figure 1: Types of air pollution complaints Dublin 2011

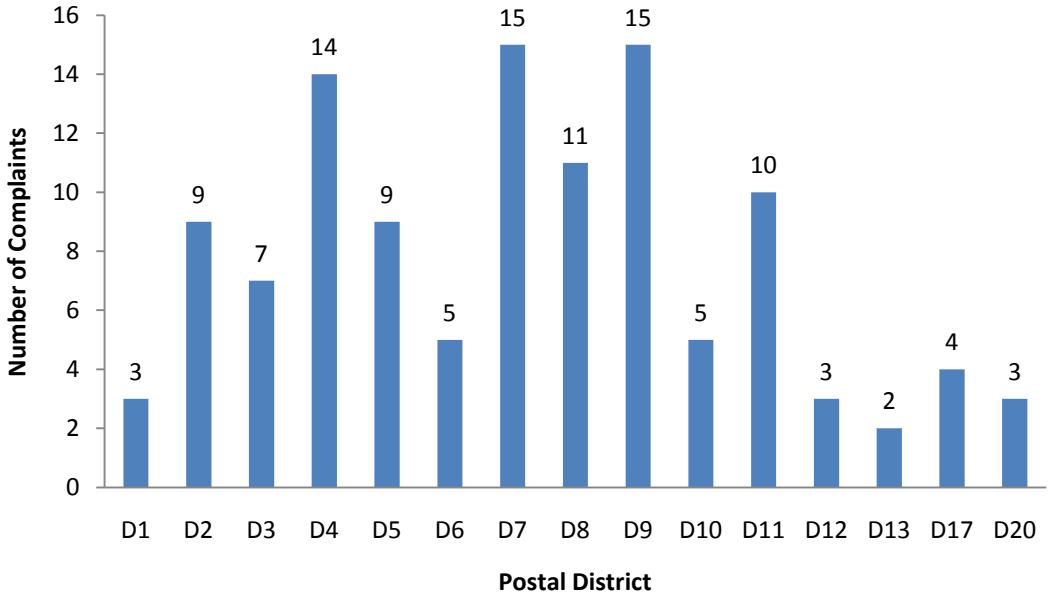


Complaints about newly-installed flues on house extensions have become problematic for the Unit, especially when the flues are emitting at ground floor level. Wood burning stoves in back gardens are also a new source of

complaint. Both may need to be considered under planning legislation in future years.

Figure 2 below shows that most complaints were received in Dublin 7 and Dublin 9 areas followed by Dublin 4 and Dublin 8 postal districts. This was a slight change in the pattern from previous years.

Figure 2: Air pollution complaints by postal district 2011



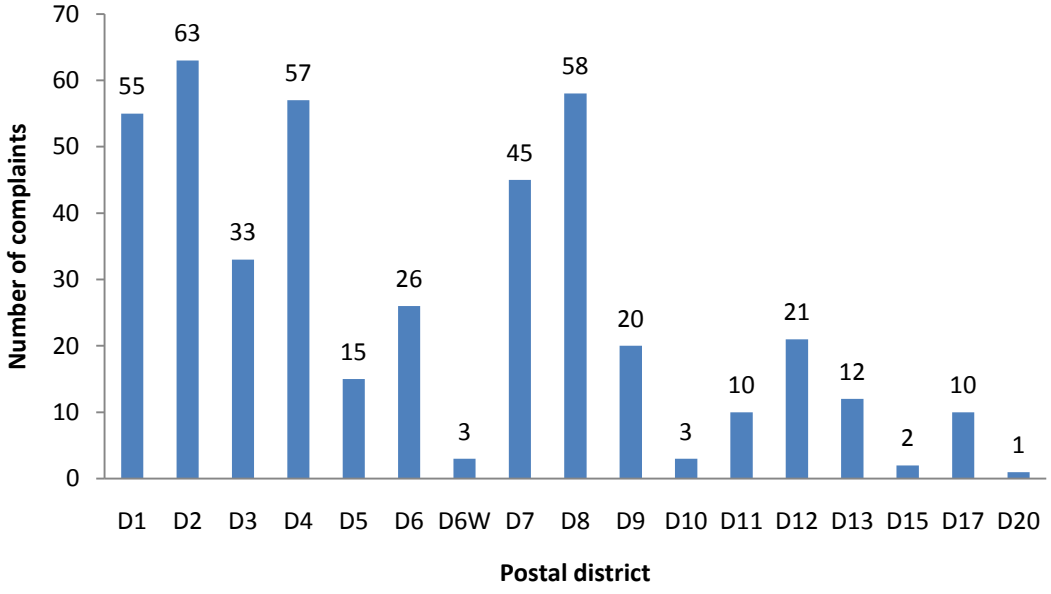
Noise complaints

The Unit also deals with complaints in relation to noise pollution from commercial and industrial premises. The Unit does not deal with neighbour noise nuisance complaints as there is provision in the legislation for individuals to deal with this on their own behalf. Environmental Health Officers (E.H.O.s) can offer advice to the public about how they can take their own action. This information can also be found on the Unit's webpage on the Dublin City Council website.

A notice can be served, by this Unit, in relation to any *"premises, processes or works"* causing a noise nuisance. Failure to comply with the terms of the notice within the time period specified can lead to the initiation of legal proceedings.

The number of complaints dealt with by the Unit in 2011 was 447 which is a slight decrease on 2010 complaint figures. As can be seen from Figure 3, the city centre postal districts of Dublin 1, Dublin 2, Dublin 4 and Dublin 8 proved to be the busiest areas of the city, following a similar trend to 2010.

Figure 3: Noise complaints by postal district 2011

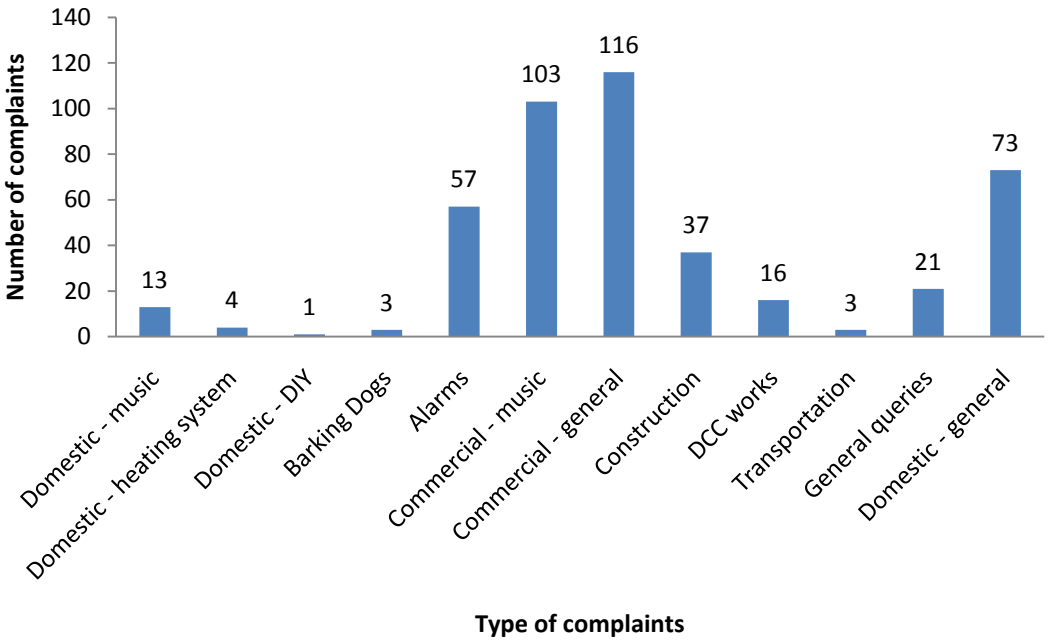


Complaints regarding commercial properties typically include noise emanating from music venues, noisy plant and equipment servicing buildings and early morning deliveries to retail units.

Despite, the downturn in the construction industry, complaints regarding noise from construction works were still received by the Unit.

See Figure 4, below, for more details.

Figure 4: Noise complaints by type 2011



Outdoor events in Dublin 2011

The wide variety of outdoor events held in Dublin annually contributes to the vibrant social scene in the city. The Unit carries out noise monitoring at the larger outdoor music events.

Outdoor music events with a capacity for more than 5,000 people are subject to planning permission or licence issued by Dublin City Council's Planning Department. As part of this process, E.H.O.s will liaise during the pre-event planning stage with the promoter and other relevant sections of Dublin City Council. Noise conditions and limits will be imposed on the event licence and noise monitoring will be carried out at these events.

In the case of events with an attendance of less than 5,000 individuals, the Unit serves notice on the promoter detailing the noise requirements for the event.

Table 1 below details the outdoor events at which noise monitoring was carried out during 2011.

Table 1: 2011 Outdoor Events

Date	Location	Artist
June 4th	IMMA Kilmainham	Forbidden Fruit festival (various)
June 5th	IMMA Kilmainham	Forbidden Fruit festival (various)
June 18th	Croke Park	Take That
June 19th	Croke Park	Take That
June 26th	Aviva	Neil Diamond
June 29th	RDS	Bon Jovi
June 30th	RDS	Bon Jovi
July 2nd	Aviva	The Script

Enforcement proceedings in 2011

During 2011 the Unit served notice under the Environmental Protection Agency Act 1992 on 10 premises.

Two cases were brought to court under the Limitations of Volatile Organic Compounds due to the use of Organic Solvents in certain Paints, Varnishes and Vehicle Refinishing Products Regulations 2007 (Paints Regulations). Both cases were adjourned for hearing until 2012.

Two cases regarding noise nuisance, under Section 108 of the Environmental Protection Agency Act 1992, were also before the courts. In both cases, following compliance of the business with the conditions of the Notice served on the premises, and the resultant resolution of the noise nuisance, both cases were, at the request of Dublin City Council, struck out.

Fuel Regulations

Enforcing the Air Pollution Act 1987 (Marketing, Sale and Distribution of Fuel) Regulations 1998 to 2011 involves targeted unannounced inspections of fuel depots, vehicles and retail outlets around the city. The legislation places the onus firmly on the coal merchants working in the industry to supply compliant fuel. However, it is envisioned that in the coming years, there will be widespread changes to the way the legislation is enforced.

Changes to the legislation

In June 2011, the Air Pollution Act, 1987 (Marketing, Sale and Distribution of Fuels) (Amendment) Regulations 2011 introduced a new maximum sulphur content for bituminous coal. A new facility for issuing fixed penalty notices was introduced under the Air Pollution (Fixed Payment Notice) Regulations 2011. This introduced on the spot fines for those not complying with the legislation. No fixed penalty notices were issued by Dublin City Council in the first winter heating season after the introduction of the new Regulations.

In addition, the Environmental Protection Agency Act, 1992 (Registration of Coal Bagging Operators and Fuel Suppliers) Regulations 2011 required that those providing a coal bagging service must register with the Environmental Protection Agency and those supplying fuel for sale must hold documentary evidence that the fuel complies with the new maximum sulphur content limit of 0.7%.

The Unit carried out 133 inspections in the 2011 winter period. No legal action was initiated. There was a marked increase in premises previously not in the business of selling coal, moving into that market. This included a number of supermarket chains and DIY stores.

A number of retail premises were found to be offering non-compliant fuel for sale during the winter period and 11 written warnings were issued to these premises. The 2011 breakdown of inspections is shown in Table 2 below.

Table 2: Fuel Regulations Inspections 2011	
Shops	85
Depots	6
Garages	30
Vehicles	10
DIY Outlets	2
Total	**133**

Air Quality Monitoring

There are a number of air monitoring sites around Dublin City that are operated and maintained by the Air Quality Monitoring and Noise Control Unit.

The Air Quality Standards Regulations 2011 (S.I. 180 of 2011) transposed the Clean Air for Europe (CAFÉ) Directive 2008 (2008/50/EC) into Irish law. The Regulations outline the requirements for monitoring pollutants, and the target values for each pollutant.

Several of these monitoring sites are deemed to be 'multi-pollutant', i.e., monitoring two or more pollutants at one location. The multi-pollutant sites at Winetavern Street and Coleraine Street provide a good picture of air quality in the city. Another site at Ballyfermot is currently not operating due to ongoing construction work at that location.

The analysers monitoring Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2) and Carbon Monoxide (CO) at the multi-pollutant sites run continuously while the Particulate Matter (PM) analysers contain filters that are collected and weighed after two week periods.

Sites

Along with the multi-pollutant sites, there are other individual sites operated by the Unit. All of the sites have been incorporated into the Quality Management System.

Multi-pollutant sites

Winetavern Street – PM_{10}, NO_2, CO, SO_2
Coleraine Street – $PM_{2.5}$, NO_2, CO, SO_2

PM_{10} only sites

Phoenix Park
Rathmines

$PM_{2.5}$ only

Marino

Black Smoke
Ringsend
Crumlin
Finglas
Cabra

Sulphur Dioxide (SO_2)

Sources

The main source of SO_2 in Dublin is space heating from residential and industrial premises.

Health and environmental effects

There are a number of health effects associated with exposure to high levels of SO_2, including breathing problems and worsening of respiratory and cardiovascular disease. People with asthma, or chronic lung disease or heart disease are the most sensitive to SO_2.

SO_2 along with NO_2, is a precursor of acid rain. It is therefore responsible for acidification of lakes and streams and accelerated corrosion of buildings.

Table 3: Limit values for Sulphur Dioxide

	Averaging period	Limit Value
Hourly limit for the protection of human health	1 hour	350μg/m^3 not to be exceeded more than 24 times a calendar year
Daily limit value for the protection of human health	24 hours	125μg/m^3 not be exceeded more than 3 times a calendar year
Limit value for the protection of ecosystems	Calendar year	20μg/m^3

Results and discussion

Levels of SO_2 in Dublin at the two multi-pollutant sites are outlined below. The results are low and well within the limits set out in the Standards.

Table 4: SO_2 results for Dublin City 2011

Site	Annual daily mean μg/m^3	Hourly max μg/m^3
Winetavern Street	1	9.1
Coleraine Street	1	17.4

The data capture rate was 100% for both sites. The multi pollutant site at Ballyfermot remained out of commission for the entire duration of 2011.

Overall, the SO_2 levels were very low and showed a decrease on 2010 figures. All analysers performed well throughout the year.

Nitrogen Dioxide (NO_2)

Nature and Sources

Nitrogen Dioxide (NO_2) is a gas produced from the burning of fossil fuels in vehicles, industrial plant, power plants and other commercial and residential sources that burn fuel.

Health and Environmental effects

NO_2 irritates the lungs and lowers resistance to respiratory infection, especially for those already suffering with breathing difficulties e.g. asthma, bronchitis.
NO_2 along with SO_2, is a precursor of acid rain. It is therefore responsible for acidification of lakes and streams and accelerated corrosion of buildings.

Table 5: Limit values for Nitrogen Dioxide

	Averaging period	Limit Value
Hourly limit value for the protection of human health	1 hour	200μg/m^3 not to be exceeded more than 18 times in a calendar year
Annual limit value for the protection of human health	Calendar year	40μg/m^3

Results and discussion

There are 2 Dublin City Council sites monitoring NO_2 continuously – Winetavern Street and Coleraine Street. These sites are situated adjacent to heavily trafficked roads.

Table 6: NO_2 results for Dublin City 2011

Site	Annual mean (μg/m^3)	No. of times NO_2 hourly level >200μg/m^3
Winetavern St	34	0
Coleraine Street	26	0

Following a breach of the EU limit value in 2009, levels of NO_2 have reduced to below the 40μg/m^3 limit for the past two years. This is a positive sign for NO_2 levels in the city. As a result of this breach, the City and County Managers in the Dublin region were required to prepare an air quality management plan to ensure compliance with the limit value for nitrogen dioxide. This plan was submitted to and accepted by the EPA in 2011. It is available to view on the Dublin City Council website at http://www.dublincity.ie/WaterWasteEnvironment/AirQualityMonitoringandnoisecontrol/Pages/AirQualityandNoiseControl.aspx

Carbon Monoxide (CO)

Nature and sources

Carbon monoxide (CO) is colourless, odourless gas produced during the incomplete combustion of fuels. The main source of environmental CO is traffic.

Health and environmental effects

CO interferes with the distribution of oxygen in the blood to the rest of the body. Depending on the level of exposure, the symptoms include fatigue, headache, disorientation, nausea and dizziness. These symptoms are similar to that of flu or food poisoning so it may prove difficult to diagnose. However, it has the potential to kill or poison in high levels, especially in poorly ventilated premises.

Table 7: Limit value for Carbon Monoxide for the protection of human health	
Averaging Period	Limit Value
Maximum Daily 8-hr mean	10mg/m^3

Results and discussion

There are two sites monitoring CO in the city, at Winetavern Street and Coleraine Street. As can be seen from below, the results remain very low in comparison with the limit set out in the legislation.

Table 8: CO results for Dublin City 2011	
Site	8 hour rolling mean (mg/m^3)
Winetavern Street	0.1
Coleraine Street	0.4

Particulate Matter ($PM_{2.5}$ & PM_{10})

Nature and sources

The main sources of particulate matter (PM) are vehicular traffic, dust from construction sites, construction equipment and any crushing and grinding operations. Indoors, the main sources are tobacco smoke, wood burning stoves, fireplaces and other home heating sources.

Health and environmental effects

When inhaled, the particles can evade the body's natural defence system and lodge in the lungs. Symptoms of exposure include a sore throat, persistent cough, wheezing, shortness of breath and chest pain. PM can increase the number of asthma attacks, or aggravate bronchitis depending on the exposure. However, those already susceptible are a greater cause for concern. This includes children, the elderly and those already suffering with breathing difficulties.

There are different types of PM, but the coarse particles known as PM_{10} are monitored at 4 sites around the city and the finer $PM_{2.5}$ are monitored at 2 sites. The CAFÉ directive provides the legal requirements for monitoring PM.

Table 9: Limit value for PM_{10}

	Averaging period	Limit value
24 hour limit value for the protection of human health	24 hours	50μg/m^3 not to be exceeded more than 35 times in a calendar year
Annual limit value for the protection of human health	Calendar year	40μg/m^3

Table 10: Limit value for $PM_{2.5}$

Annual limit value for the protection of human health	Calendar year	25μg/m^3

Results and discussion

The 2011 figures detailed in Table 11 below, show quite similar results to 2010. Although the number of days above 50μg/m^3 at Rathmines trebled, the site still complies with the legislation.

Table 11: PM_{10} results for Dublin City 2011

Site	2011 Annual Mean μg/m^3	No. of days >50μg/m^3
Phoenix Park	12	3
Rathmines	16	10
Winetavern Street	14	7

The annual PM_{10} mean for all sites was below the 40μg/m^3 allowed in the Regulations.

With regard to $PM_{2.5}$ levels, detailed in Table 12 below, there is no limit to the number of days in which the limit value of 25μg/m^3 can be exceeded, although it was exceeded a number of times at both sites.

Table 12: $PM_{2.5}$ results for Dublin City 2011	
Site	**Annual mean (μg/m^3)**
Marino	9
Coleraine St	11

Background Air Quality Monitoring

Daily black smoke

The original smoke and SO_2 network comprised approximately 15 sites back in the 1980s and mid-1990s. Due to the vast improvement in air quality since the introduction of the coal ban, the sites have been dramatically scaled down in number and there are currently only 4 sites operational – Finglas, Cabra, Crumlin and Ringsend.

Black smoke monitoring is now carried out as a form of background monitoring, using the benchmark of EU Directive 80/779/EEC as a guide.

Results and discussion

Black Smoke monitoring is no longer mandatory in Ireland, since 2005 when EU Directive 80/779/EEC was revoked. As Black Smoke monitoring has been carried out for many years in Dublin City Council, it is decided to continue to carry out this monitoring to give an overall picture of air quality in the city.

The maximum level of smoke was recorded at Crumlin with 34$\mu g/m^3$.

Table 13: Black smoke results for Dublin City 2011

Site	Annual mean Smoke $\mu g/m^3$	Annual Median Smoke $\mu g/m^3$	Maximum Smoke $\mu g/m^3$
Finglas	4	3	25
Cabra	3	2	25
Crumlin	5	5	34
Ringsend	4	2	32

Control of Volatile Organic Compounds (VOC's)

VOC's are air pollutants which can have detrimental effects on human health by contributing to respiratory illnesses. Some VOC's are mutagenic or toxic to reproduction and harmful to the unborn. They also have harmful environmental effects (e.g. crop, vegetation and materials damage, reduced visibility etc.) when they chemically react with oxides of nitrogen and sunlight to form ground-level ozone. Potential sources include vehicle emissions, fuel combustion and domestic solvent usage. Other major sources of VOC's include commercial and industrial activities using organic solvents.

Role of Dublin City Council

Solvents Regulations

The Emissions of Volatile Organic Compounds from Organic Solvents Regulations 2002 introduced controls on emissions of VOC's from various commercial activities including dry cleaning, pharmaceutical manufacture etc. Dublin City Council has granted Certificates of Compliance only to dry cleaners to date. There is an annual renewal for VOC applications.

In 2011, 32 Certificate of Compliance were issued to Dry Cleaners, including two new installations.

Decorative Paints Regulations

Under the Limitations of Volatile Organic Compounds due to the use of Organic Solvents in certain Paints, Varnishes and Vehicle Refinishing Products Regulations 2007 (Paints Regulations) any premises carrying out spraying or refinishing of vehicles must apply for a Certificate of Approval to the Council. The renewal of Certificates of Approval, under the 2007 Regulations, is every 2 years.

In 2011, 23 Certificates of Approval were issued to vehicle refinishing premises.

Environmental Health Officers continue to inspect, renew and grant Certificates of Compliance / Approval to those industries included in the Regulations.

STRIVE research project

In 2010, the Air Quality Monitoring and Noise Control Unit of Dublin City Council together with the Environmental Health Sciences Institute (EHSI) and Dublin Institute of Technology (DIT), with the assistance of the Health Service Executive (HSE), successfully tendered for an EPA funded project assessing the use of Bituminous fuels in the domestic setting in Ireland and its contribution to PM_{10}, $PM_{2.5}$ and Polycyclic Aromatic Hydrocarbons (PAH) levels.

Four centres around Ireland were selected for air quality monitoring. These centres are Tralee, Killarney, Letterkenny and Navan. The rationale for choosing these locations is that:

1. Each of these is a major population centre in accordance with the Central Statistic Office Census 2006.

2. Ongoing continuous monitoring of air quality is not carried out at any of these locations.

3. Previous air quality studies (carried out in Navan and Tralee by the EPA) indicate levels of PM_{10} greater than other towns in Ireland where a ban on solid bituminous fuels sales exists.

4. The national natural gas grid is available in Navan but not in the three other centres

5. There is a ban on the sale of bituminous fuels in Tralee but not at the other locations.

The monitoring commenced in 2011 at all four locations and will continue into 2012. The monitoring was carried out for Black smoke, PM_{10} and $PM_{2.5}$ at each location. The duration of the monitoring programme is scheduled to be twelve months in total, comprising, 12 months continuous black smoke monitoring at each location and 6 months of PM_{10} and $PM_{2.5}$ monitoring at each location. This will ensure that the maximum period for seasonal space heating in the domestic sector is captured in the dataset.

Reference Material and Internet Addresses

For information on services provided by the Air Quality Monitoring & Noise Control Unit of Dublin City Council:

http://www.dublincity.ie/WaterWasteEnvironment/AirQualityMonitoringandNoiseControl/Pages/AirQualityandNoiseControl.aspx

For Information on real-time air quality monitoring:

http://www.epa.ie/whatwedo/monitoring/air/data/

For updates on developments at European Union level on air quality:

http://ec.europa.eu/environment/air/index.htm

For information on developments at European Level on noise control:

http://ec.europa.eu/environment/noise/home.htm

For information on national environmental issues:

http://www.environ.ie/en/

For information on Accredited Inspection Contractors (AIC's)

www.inab.ie