The Environment Matters

Annual Report 2012

Department of the Environment

HM Government of Gibraltar

Foreword

The Environment has at last taken its rightful place as one of the most important strands in the policies of HM Government of Gibraltar.

Any Government anywhere has a responsibility to its communities and its citizens. But environmental responsibility extends beyond its borders. Be it by reduction in carbon emissions to reduce impact on climate, or protection of migratory birds that pass through Gibraltar, action taken in Gibraltar impacts elsewhere, and so our responsibilities are all that much greater.

The work of the Department of the Environment and its contractual partners has been more intense and wider ranging than ever before. In ensuring maximum involvement in the Government's green filter, in influencing the introduction of new initiatives such as green procurement, increased recycling, energy efficiency, tree planting and many more, Gibraltar, during 2012, took a quantum environmental leap into the second decade of the 21st Century, while at the same time working towards an improved quality of life for our residents.

This Annual Report summarises some of the more significant aspects of this work. I want to thank all those professionals in the Ministry, Department and our contractual partners, for their continued commitment in making this possible.

I hope you will enjoy learning about our work as much as I have enjoyed being involved in and supporting it.

With best wishes

Dr John Cortes MBE, D.Phil
Minister for Health and the Environment
HM GOVERNMENT OF GIBRALTAR

Executive Summary

The Department of the Environment, working with the Environmental Agency, continues to strive to improve the local environment and ensure compliance with environmental legislation.

In relation to air quality, our air pollution monitoring programme demonstrated compliance with the majority of the European Commission's target values for regulated pollutants, including benzene, sulphur dioxide, ozone and carbon monoxide.

Nitrogen Dioxide (NO_2) exceeded the annual mean at both Witham's Road and Rosia Road monitoring stations. The NO_2 TEN application was submitted in 2010 and it was subsequently granted in 2011 on the understanding that the Gibraltar Air Quality Action Plan would be implemented. Data provided by the nitrogen dioxide diffusion tube network in the south district, especially around the Jumpers area, and the monitoring station at Witham's Road confirm that elevated nitrogen dioxide levels are the result of emissions from the OESCO and ISGS power stations. Modelling carried out previously also confirmed that these elevated levels are attributable to these power stations. It is expected that the closure of these stations in the future will facilitate compliance with the Directive. The closure of these two stations and the building of a modern and cleaner power station formed the basis of the TEN application. Emissions from traffic are also a significant contributing source and this will also have to be tackled to ensure future compliance.

During 2012 Gibraltar did not exceed the particulate matter (PM_{10}) annual mean or the 24 hour mean, in contrast to 2010 where national and European Limit Values were breached for the 24 hour mean, and illustrates the on-going improvements generated under the Air Quality Action Plan of 2010. As well as the introduction and implementation of the Environment (Control of Dust) Regulations 2010. The ratified data also showed that there were no exceedances of Lead, Cadmium, Arsenic, and Poly Aromatic Hydrocarbons. However nickel has exceeded the target value by 9.09 ng m^{-3}.

In 2012, in relation to portable water, AquaGib Ltd produced and supplied 1,491.542.00 m^3. "Check" and "Audit" monitoring were carried out in accordance with EC 98/83/EC and the Public Health (Potable Water) Rules 1994. The Environmental Agency and AquaGib Ltd jointly took a total of 245 "check" and 6 audit "audit" samples during 2012. Gibraltar continues to produce potable water of a very high standard both chemically and bacteriologically.

Gibraltar entered its fourth year of coastal water monitoring. Beaches in Gibraltar have always met the Mandatory Values and some of them have met the more stringent Guide

Values consistently each year. However, since 2011 results of samples taken from Western Beach have shown that the quality of the water has suffered deterioration and has failed to meet the Mandatory Values on several occasions. The Western Beach Bathing Protocol has continued to be in operation throughout the bathing season.

H.M. Government of Gibraltar, in accordance with the requirements of section 17C(1) of the Nature Protection Act 1991 and Article 4(4) of the European Commission's Habitats Directive 92/43/EC, has designated the Southern Waters of Gibraltar SCI as a marine Special Area of Conservation (SAC). A protection regime has been in existence since 1991 through the Nature Protection Act (1991) which is now supplemented by the Southern Waters of Gibraltar Management Scheme.

Gibraltar continues to strive to protect its flora and fauna. The Macaque population remains stable and mouse-eared bats were sighted at Martin's Cave; a species which has not been recorded in Gibraltar for some time. A successful gull culling programme has resulted in declining numbers; however the number of Barbary Partridges recorded during 2012 was very low.

During 2012, the existing recycling scheme of glass and cans was expanded to also include paper, cardboard and plastics. Although recycling rates are generally increasing, levels still remain low and a serious commitment from the local community is needed to meet EU recycling targets.

Public awareness and education were again at the forefront of the Department's work with presentations given to all schools based on this year's World Environment Day Theme, The Green Economy. Another World Environment Day was hosted aimed to invite people to examine their activities and lifestyle and see how the concept of a "Green Economy" fits into it.

The Thinking Green Conference held in October was heralded a resounding success. It included a trade fair in which local businesses and Non-Government Organisations (NGOs) were able to display carbon-friendly technologies and raise general awareness of local environmental issues of concern. The conference itself, which was attended by approximately 1000 people, included talks by Dr John Cortes, Minister for Health & the Environment, Juan Verde, advisor to the Obama administration, and former US Vice President Al Gore.

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Chapter 8: Gibraltar Broadcasting Corporation

Chapter 1

Air Quality

We breathe from the moment we are born until the moment we die. It is a vital and constant need, not only for us but for all life on Earth. Poor air quality affects us all: it harms our health and the health of the environment. Gibraltar's air quality measurements are underpinned by a rigorous quality assurance and control programme, central to which are crosschecked calibration standards that are traceable to and compared with internationally recognised metrology standards.

1.1 Introduction

This section of the report provides an overview of Gibraltar's air quality measurements for the calendar year of 2012. It includes data for the automatic and non-automatic monitoring networks.

The Gibraltar Air Monitoring Programme consists of three automatic monitoring stations measuring a variety of pollutants and a passive monitoring network measuring nitrogen dioxide and Volatile Organic Compounds through the use of diffusive samplers. The equipment deployed on the existing network is set out in Table 1.

Table 1.1 The Gibraltar Air Monitoring Programme

Location	Pollutants Measured	Equipment Types
Electricity Offices (Rosia Road)	Sulphur dioxide	API M100E (Ultraviolet flourescence)
	Oxides of nitrogen	API M200E (Chemiluminescence)
	Carbon monoxide	API M300E (Infrared Absorption)
	PM_{10} Gravimetry	R&P Partisol 2025
	$PM_{2.5}$ Gravimetry	R&P Partisol 2025
	PM_{10} Automatic	TEOM FDMS
	Poly Aromatic Hydrocarbons	Digitel High Volume Sampler
	Volatile Organic Compounds	Environment VOC71M Gas Chromatograph
	Wind speed & direction	Gill Windsonic
	Ambient temperature	Met One 592
Bleak House (Near Europa Point)	Oxides of nitrogen	API M200E (Chemiluminescence)
	Ozone	API M400E (Ultraviolet absorption)
	PM_{10} Gravimetry	R&P Partisol 2025
	Wind speed & direction	Gill Windsonic
	Ambient temperature	Met One 592
Witham's Road	Oxides of nitrogen	API M200E (Chemiluminescence)
	Wind speed & direction	Gill Windsonic
	Ambient temperature	Met One 592
Passive Network (Various locations)	Nitrogen Dioxide	Diffusive Samplers - Palmes Tubes at 27 sites
	Volatile Organic Compounds	Diffusive Samplers – SorbentTubes at 15 sites

The primary objectives of the monitoring network are:

- To provide the public with rapid and reliable information on urban air quality.
- To monitor compliance with European Directives and local statutory instruments.
- To assist in developing new policies.

The instrumentation deployed was selected to ensure robust measurements at the necessary level of accuracy and time resolution to meet the data quality objectives within the European Air Quality Directives and national legislation.

The monitoring equipment itself forms only one aspect of the overall Gibraltar Air Monitoring Programme. Appropriate maintenance and support, coupled with a well-designed and managed quality control regime, ensure that the raw monitoring data obtained are successfully processed, analysed and interpreted, in order to provide information and ensure compliance under the Air Quality Framework.

Gibraltar air pollutant measurements are underpinned by a rigorous quality assurance and control programme, central to which are crosschecked calibration standards that are traceable to and compared with internationally recognised meteorology standards.

The non-automatic network consists of a diffusion tube programme for Nitrogen Dioxide and Benzene, Toluene and Xylenes (BTEX) as well as three partisol filters (Gravimetric) units which are used to monitor particulate matter (PM_{10} & $PM_{2.5}$), Lead, Arsenic, Cadmium, and Nickel and a Digital High Volume Sampler monitoring Poly Aromatic Hydrocarbons (measured as Benzo(a)pyrene).

In addition to meeting the Gibraltar Government's monitoring obligations, the data are disseminated in near real-time on the www.gibraltarairquality.gi website. This web-based dissemination and reporting is an important tool for delivery of air quality data and descriptive statistics to a broad range of end users.

The site provides wide and unrestricted accessibility to air quality data and has been designed to be user-friendly, interactive and responsive.

Users may download unlimited portions of the database in spread-sheet format or graphs. The website has proved, and continues to prove, popular as demonstrated in Table 1.2.

Table 1.2 Gibraltar Air Quality Website Hits 2012

Month	Unique visitors	Number of visits	Hits
Jan	728	587	1936
Feb	614	474	1,988
Mar	650	449	2,117
Apr	583	456	1,759
May	853	663	2,889
Jun	609	457	1,707
Jul	586	377	2,384
Aug	612	419	2,102
Sep	600	440	1,473
Oct	707	484	2,279
Nov	228	110	612
Dec	176	92	373
Total	6,946	5,008	21,619

1.2 Gibraltar Air Quality Standards

Standards and objectives are set for air pollutant concentrations in ambient air, over a given time period, that are considered to be acceptable in the light of what is known about the effects of each pollutant on health and on the environment. They can also be used as a benchmark to see if air pollution is getting better or worse.

The Gibraltar Ambient Air Quality Standards, in place for the purpose of local air quality management, are found in the Environment (Air Quality Standards) Regulations 2010. This transposed into Gibraltar law the latest Air Quality Directive 2008/50/EC (known as the

CAFÉ Directive - Clean Air For Europe), which merged all existing air quality directives into a single Directive. It also lays down Air Quality values for $PM_{2.5}$.

A summary of the current Gibraltar Air Quality Objectives is set out in Table 1.3.

Table 1.3: Summary of Current Gibraltar Air Quality Objectives

Pollutant	Objective	Measured as	To be achieved by
Benzene	5 µg/m^3	Annual Mean	1 January 2010
Carbon monoxide	10.0 mg/m^3	Maximum daily running 8 Hour Mean	1 January 2005
Lead	0.5 µg/m^3	Annual Mean	1 January 2005
Nitrogen dioxide	200µg/m^3 Not to be exceeded more than 18 times per year	1 Hour Mean	1 January 2010
	40 µg/m^3	Annual Mean	1 January 2010
Nitrogen Oxides**	(V) 30 µg/m^3	Annual Mean	19 July 2001
Ozone	120 µg/m^3	Daily maximum running 8 hr mean not to be exceeded more than 25 times per calendar year averaged over 3 years	1 January 2010
Particles[a] (PM10) (gravimetric)	50µg/m^3 Not to be exceeded more than 35 times per year	24 Hour Mean	1 January 2005
	40 µg/m^3	Annual Mean	1 January 2005
Sulphur dioxide	350µg/m^3 Not to be exceeded more than 24 times per year	1 Hour Mean	1 January 2005
	125µg/m^3 Not to be exceeded more than 3 times per year	24 Hour Mean	1 January 2005
	(V) 20 µg/m^3	Annual Mean	19 July 2001
	(V) 20 µg/m^3	Winter Mean (01 October – 31 March)	19 July 2001
Arsenic	6 ng/m^3	Annual Mean	31 December 2012
Cadmium	5 ng/m^3	Annual Mean	31 December 2012
Nickel	20 ng/m^3	Annual Mean	31 December 2012
PAH (Benzo[a]pyrene*)**	1 ng/m^3	Annual Mean	31 December 2012

Notes:

a. Measured using the European gravimetric transfer sampler or equivalent.
µg/m^3 – micrograms per cubic metre
mg/m^3 – milligrams per cubic metre
ng/m^3 – nanograms per cubic metre
** Assuming NOx is taken as NO_2
*** Benzo[a]pyrene is used as a marker for the carcinogenic risk of polycyclic aromatic hydrocarbons in ambient air.
(V) These standards are adopted for the protection of vegetation and ecosystems. All of the remainder are for the protection of human health.

1.3 Annual Automatic Data Summary Reports

Figure 1. Map showing locations of automatic monitoring stations

All the data in this report have been fully ratified. All gaseous pollutant mass units are at 20^{o}C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure.

Note: For a strict comparison against the objectives there must be a data capture of >90% throughout the calendar year.

1.3.1 Rosia Road: 1st January to 31st December 2012

Rosia Road air quality monitoring station has been in operation since early 2005, measuring the following parameters: Carbon Monoxide, Nitrous Oxides, Particulate Matter, Sulphur Dioxide, Metals and Polycyclic aromatic hydrocarbons (PAHs). The station is situated on a busy roadside, encapsulating measurements from vehicular traffic and the OESCO Power Station in the nearby area. Graphs 1.1 – 1.3 summarise the hourly mean data of CO, NO_2 & NO_2 respectively. Tables 1.4 & 1.5 show the data capture from specific pollutants measured on site. These show that during 2012 at the Rosia Road site NO_2 exceeded the 40 µg m^{-3} by 6 µg $m^{-3.}$ This is discussed further in section 1.4.2. Aside from NO_2 no other exceedances were reported.

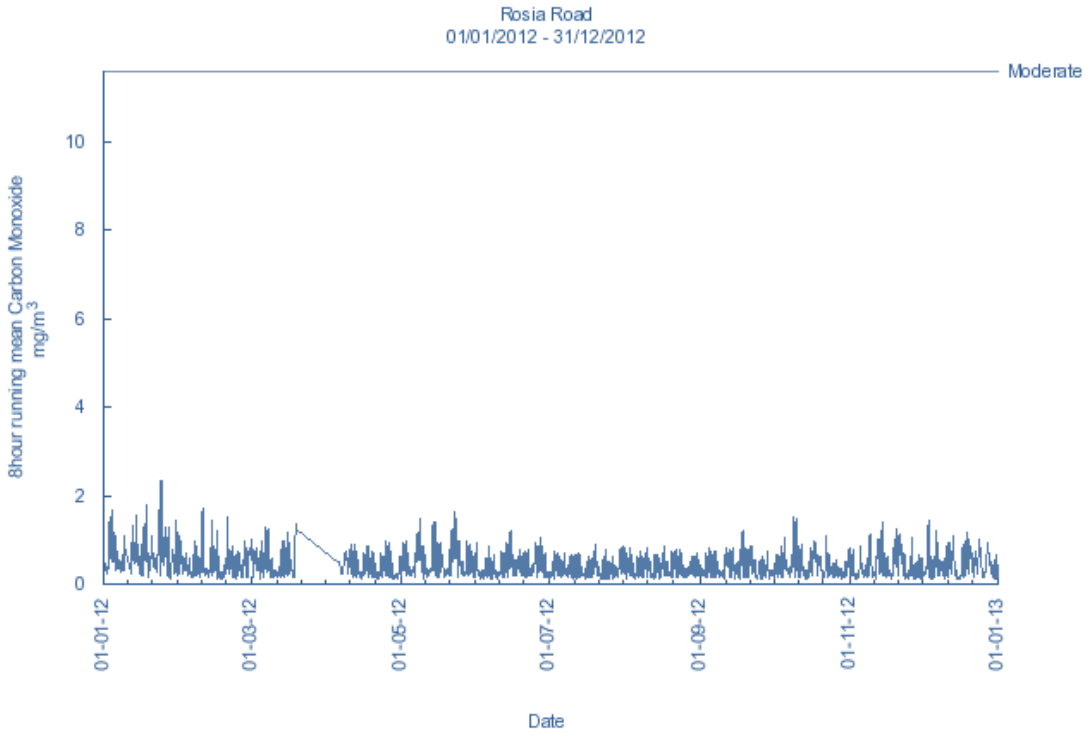
Table 1.4

POLLUTANT	BENZ	CO	NO_2	SO_2
Maximum hourly mean	60.7 µg m^{-3}	5 mg m^{-3}	159 µg m^{-3}	96 µg m^{-3}
Maximum running 8-hour mean	29.2 µg m^{-3}	2.3 mg m^{-3}	112 µg m^{-3}	65 µg m^{-3}
Maximum running 24-hour mean	12.6 µg m^{-3}	1.2 mg m^{-3}	92 µg m^{-3}	42 µg m^{-3}
Maximum daily mean	11.0 µg m^{-3}	1.1 mg m^{-3}	88 µg m^{-3}	37 µg m^{-3}
Average	1.7 µg m^{-3}	0.5 mg m^{-3}	46 µg m^{-3}	10 µg m^{-3}
Data capture	96.2 %	99.0 %	99.0 %	99.0 %

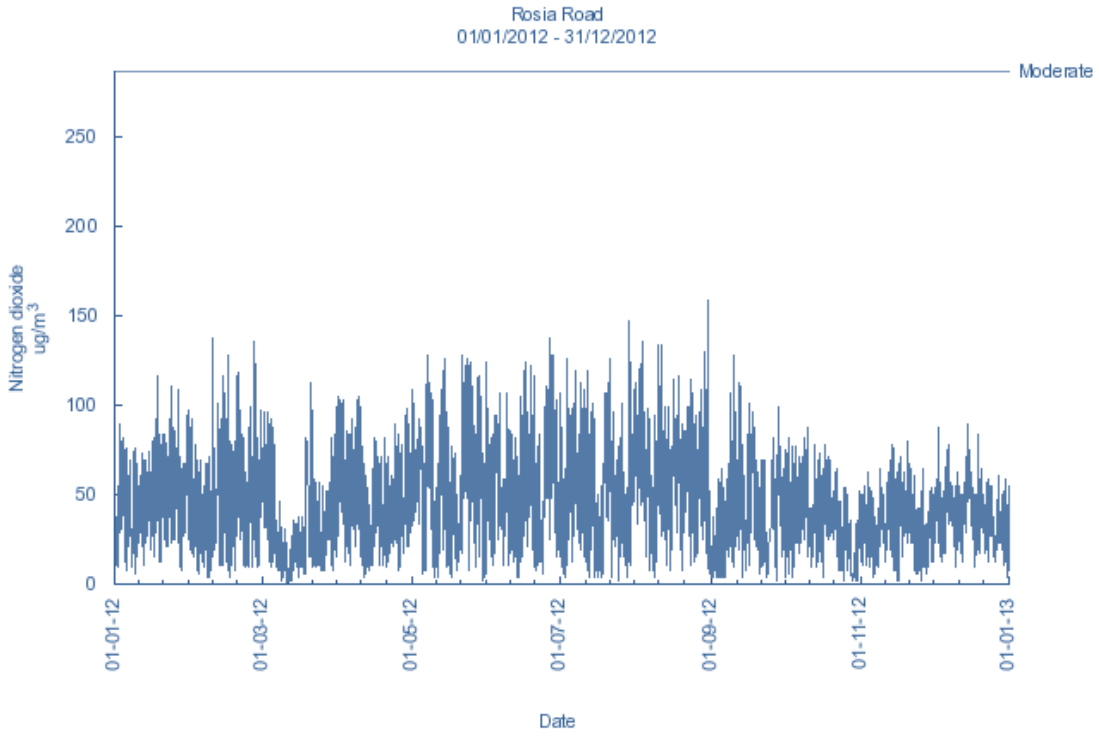
Table 1.5

Pollutant	Public Health (Air Quality Limit Values) Rules 2002, (Amendment) Rules 2003 and (Ozone) Rules 2004	Exceedances	Days
Carbon Monoxide	Running 8-hour mean > 10.0 mg m^{-3}	0	-
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	1	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	-
Sulphur Dioxide	Annual mean > 20 µg m^{-3}	0	-

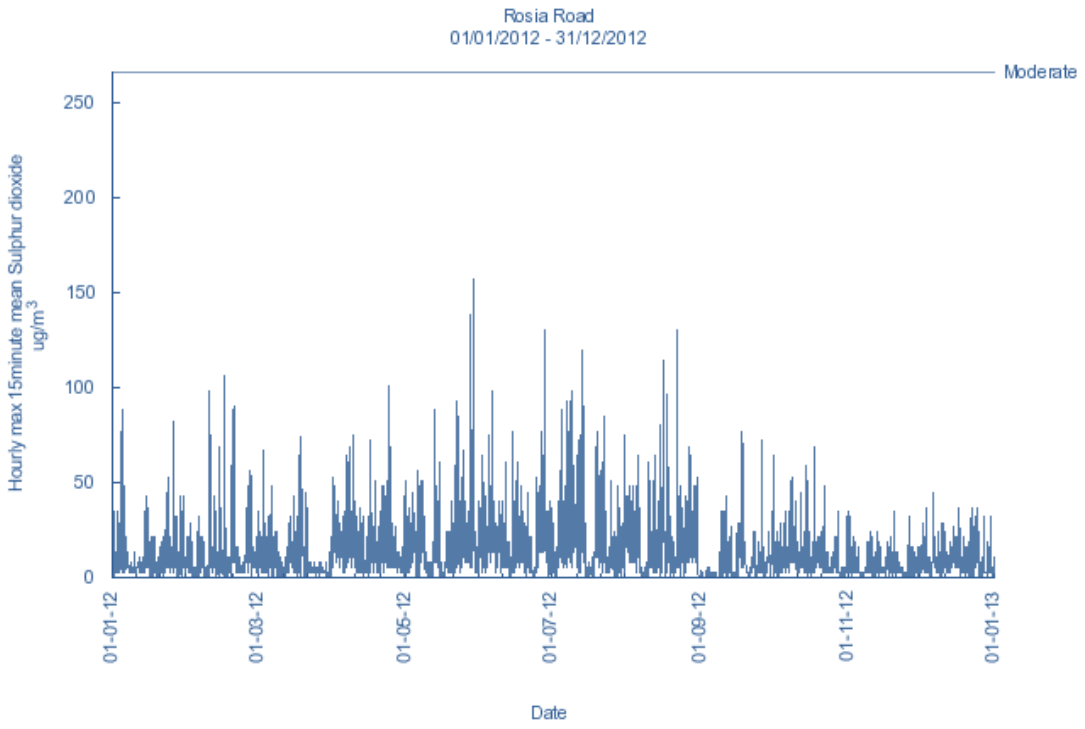
Graph 1.1: Hourly Mean Data for 1st January to 31st December 2011 of CO



Graph 1.2: Hourly Mean Data for 1st January to 31st December 2012 of NO_2



Graph 1.3: Hourly Mean Data for 1st January to 31st December 2012 of SO_2



1.3.2 Bleak House: 1st January to 31st December 2012

Bleak House air quality monitoring station has been in operation since February 2005. This location was chosen to give a background suburban area reading in comparison to roadside monitoring stations such as Rosia Road and Witham's Road stations. Tables 1.6 & 1.7 show the data capture and measurements for specific pollutants and show that there have been 8 exceedances in 8 days with regards to Ozone in 2012.

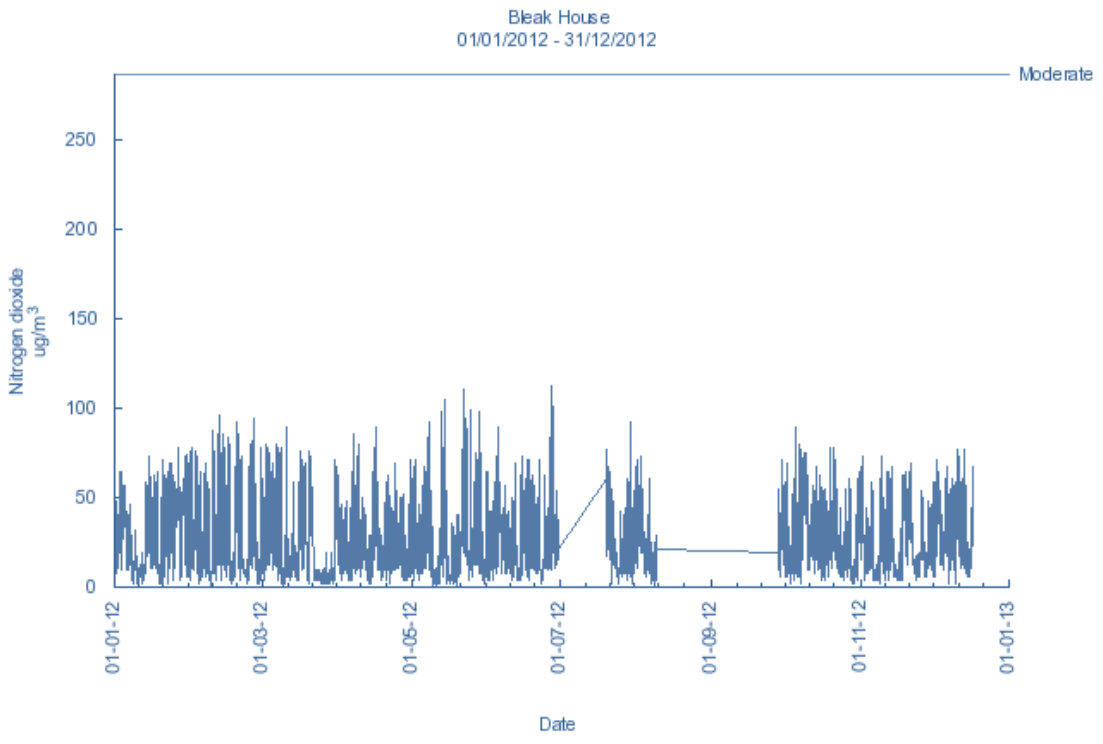
Table 1.6

POLLUTANT	NO_2	O_3
Maximum hourly mean	113 µg m^{-3}	148 µg m^{-3}
Maximum running 8-hour mean	86 µg m^{-3}	142 µg m^{-3}
Maximum running 24-hour mean	66 µg m^{-3}	122 µg m^{-3}
Maximum daily mean	60 µg m^{-3}	122 µg m^{-3}
Average	27 µg m^{-3}	56 µg m^{-3}
Data capture	76.0 %	95.0 %

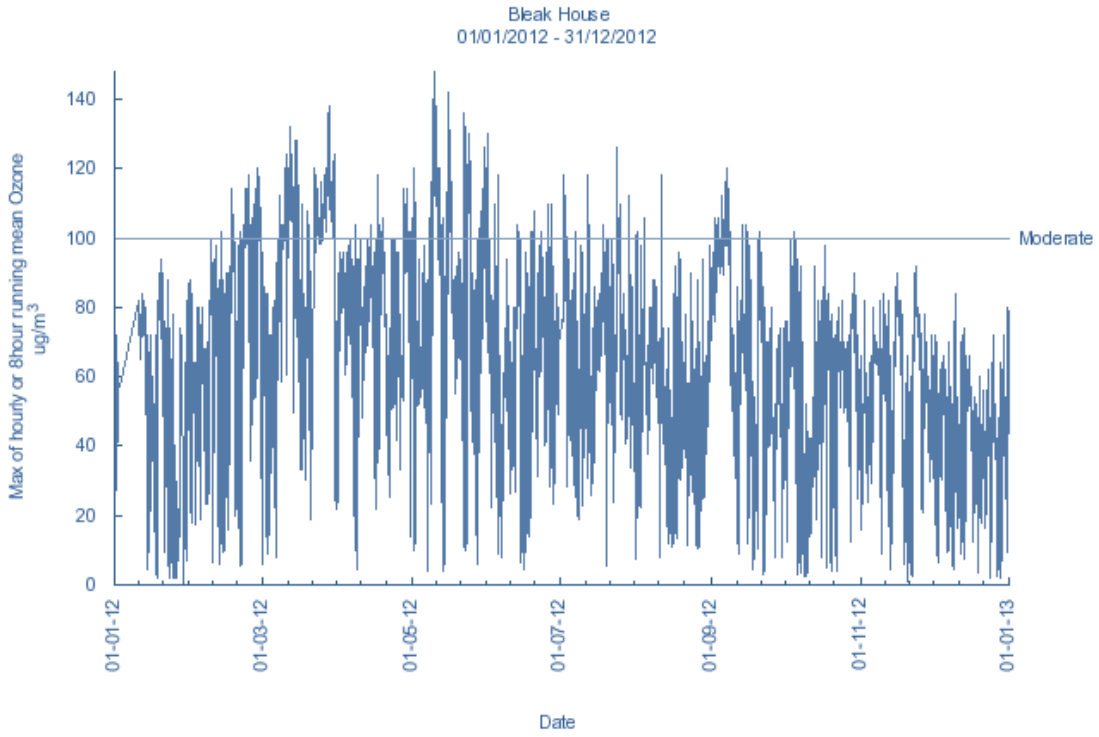
Table 1.7

Pollutant	Public Health (Air Quality Limit Values) Rules 2002, (Amendment) Rules 2003 and (Ozone) Rules 2004	Exceedances	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	2	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	-
Ozone	Running 8-hour mean > 120 µg m^{-3}	8	8

Graph 1.4: Hourly Mean Data for 1st January to 31st December 2012 of NO_2



Graph 1.5: Hourly Mean Data for 1st January to 31st December 2012 of Ozone.



1.3.3 Witham's Road: 1st January to 31st December 2012

Witham's Road air quality monitoring station has been in operation since 2008. The station's location is roadside in an urban setting, where the OESCO and ISGS power stations are in the vicinity. This location was chosen to closely monitor the effect of traffic and emissions from the power stations. Tables 1.8 & 1.9 show the pollutants measured at Witham's Road and show that there was one exceedance in 2012 in terms of NO_2 annual mean values. Graph 1.3 illustrates hourly mean data for NO_2 in 2012.

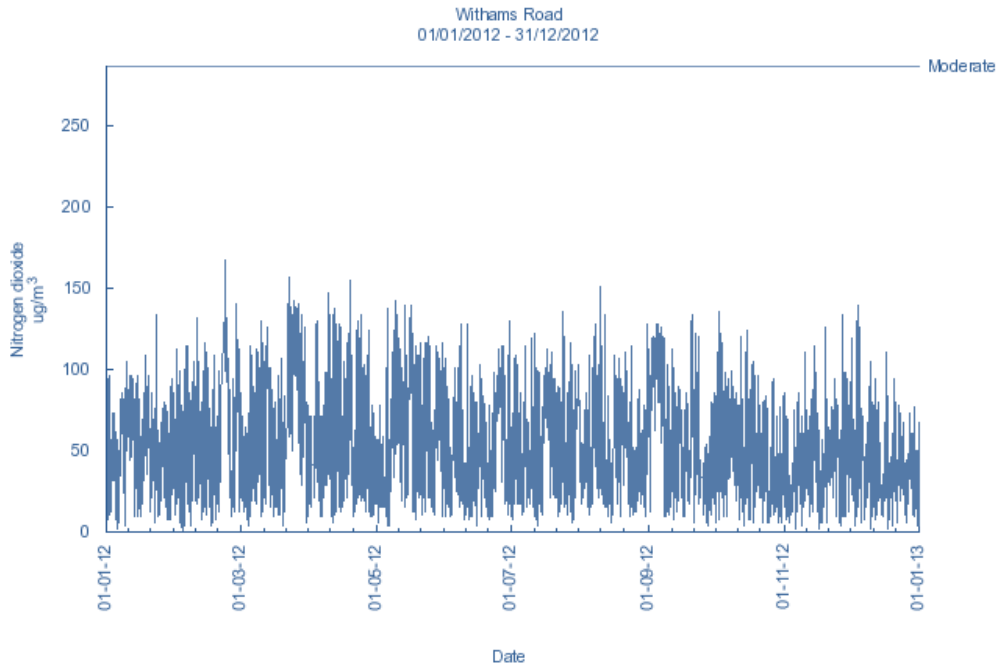
Table 1.8

POLLUTANT	NO_2
Maximum hourly mean	168 µg m^{-3}
Maximum running 8-hour mean	136 µg m^{-3}
Maximum running 24-hour mean	117 µg m^{-3}
Maximum daily mean	115 µg m^{-3}
Average	54 µg m^{-3}
Data capture	98.0 %

Table 1.9

Pollutant	Public Health (Air Quality Limit Values) Rules 2002, (Amendment) Rules 2003 and (Ozone) Rules 2004	Exceedances	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	1	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	-

Graph 1.3 Hourly Mean Data for 1st January to 31st December 2012 of NO_2



1.4 Overview of Gibraltar's automatic air pollution measurements

The data capture figures reflect data capture over the whole year, 1st January to 31st December 2012.

Table 1.10: Data capture in 2012 (%)

	UK	Gibraltar
NO_2 and NO_x	91.2	98
SO_2	92.2	99
CO	96.5	94
PM_{10} (grav.)	88.8	90
$PM_{2.5}$ (grav.)	89.5	92
O_3	93.2	95
Benzene	90.6	96.2

Gibraltar data capture has this year been slightly lower than from its onset in 2005. This is primarily due to servicing and repairs of the equipment. The Environmental Agency works

closely with UK consultancy AEA Environment and Technology to continue to provide a high efficiency of data capture in the monitoring stations.

1.4.1 Carbon monoxide

Carbon monoxide (CO) is a colourless, odourless, poisonous gas produced by incomplete or inefficient combustion of fuel. It is produced predominantly by the road transport sector, particularly by petrol engines. It prevents the normal transport of oxygen by the blood, which in turn can lead to a significant reduction in the supply of oxygen to the heart, particularly in people suffering from heart disease.

This pollutant is measured at the Rosia Road station.

Table 1.11

Air quality objective for CO (as maximum daily running 8hr mean)	Recorded levels (as maximum daily running 8hr mean)
10.0 mg m^{-3}	**2.3 mg m^{-3}**

Gibraltar's recorded levels are well below the maximum permissible under the Air Quality Rules. The level recorded is slightly higher than last year's and in general, carbon monoxide levels over the last 7 years show that we are well within the recommended levels for this pollutant.

SUMMARY: There were no exceedances of the carbon monoxide air quality objectives within our National Rules or the European Limit Values.

1.4.2 Nitrogen Dioxide

Nitrogen oxides (NO_x) is a collective term used to refer to two species of oxides of nitrogen, nitric oxide (NO) and nitrogen dioxide (NO_2). NO is mainly derived from road transport emissions and other combustion processes such as electricity supply. NO is not considered to be harmful to health, however, once released into the atmosphere, NO is very rapidly oxidised to NO_2 which can be harmful to human health, irritating the lungs and lowering resistance to respiratory infections such as influenza.

This pollutant is measured at Rosia Road, Witham's Road and Bleak House monitoring stations.

There are two air quality objectives for NO_2: a long-term annual mean objective, set to protect against long-term exposure to elevated NO_2 concentrations; and a short-term 1-hour objective set to protect against short-term elevated NO_2 concentrations.

Annual Objective

As per the Air Quality Directive 2008/50/EC, Gibraltar's annual mean air quality objective for NO_2 is 40 µg m-^{3}. It can be seen from table 1.12 that this level was exceeded at Rosia Road and Witham's Road stations.

Table 1.12

Air Quality Objective for NO_2	Recorded Annual Mean
40 µg m^{-3}	**46 µg m^{-3} (Rosia Road)** **54 µg m^{-3} (Witham's Road)** **27 µg m^{-3} (Bleak House)**

In 2010 Gibraltar was successful in its application for a Time Extension Notification. Gibraltar has until the end of 2014 to achieve compliance with the air quality objective for NO_2 of 40µg m^{-3}. It is envisaged that the closure of the existing power stations will assist Gibraltar in complying with its EU requirements.

Hourly Objective

The 1-hour air quality objective for nitrogen dioxide is 200µg m^{-3} which cannot be exceeded more than 18 times per year.

Table 1.13

Air Quality Objective for NO_2 (1 hour mean)	Recorded 1 hour mean
200 µg m^{-3} not to be exceeded more than 18 times per year	**159 µg m^{-3} (Rosia Road)** **168 µg m^{-3} (Witham's Road)** **113 µg m^{-3} (Bleak House)**

SUMMARY: There were no exceedances of the 1-hour air quality objective for nitrogen dioxide throughout the monitoring sites.

1.4.3 Sulphur Dioxide

Sulphur Dioxide (SO_2) is produced when a material, or fuel, containing sulphur is burned. Globally, much of the sulphur dioxide in the atmosphere comes from natural sources, but in Gibraltar the predominant source is the power station and shipping burning fuel oils.

Even moderate concentrations of sulphur dioxide may result in a fall in lung function in asthmatics. Tightness in the chest and coughing occur at high levels and lung function of asthmatics may be impaired to the extent that medical assistance is required. Sulphur dioxide pollution is considered more harmful when particulate and other pollution concentrations are high.

This pollutant is measured at the Rosia Road station.

There are two air quality objectives set for SO_2, a daily mean objective and a 1-hour objective, as set out below.

Table 1.14

Air Quality Objective for SO_2 (Daily Mean)	Recorded Daily Mean
125 µg m^{-3} not to be exceeded more than 3 times per year	**37 µg m^{-3}**
350 µg m^{-3} not to be exceeded more than 24 times per year	**96 µg m^{-3}**

SUMMARY: There were no exceedances of either limit value for sulphur dioxide in 2012.

1.4.4 Benzene

Benzene is a volatile organic compound which is a minor constituent of petrol (approximately 1% by volume). The main sources of atmospheric benzene in Europe are the distribution and combustion of petrol. Of these, combustion by petrol vehicles is the single biggest source.

Possible chronic health effects include cancer, central nervous system disorders, liver and kidney damage, reproductive disorders and birth defects.

This pollutant is measured at the Rosia Road station. The air quality objective for benzene is 5 µg m^{-3}, measured as an annual mean. In 2012, the annual mean was measured at 1.7 µg m^{-3}, which is below the Benzene Annual Mean Limit Value.

Table 1.15

Air Quality Objective for Benzene (Annual Mean)	Recorded Annual Mean
5 µg m^{-3}	**1.7 µg m^{-3}**

SUMMARY: There was no exceedance of the Benzene annual mean objective in 2012.

1.4.5 Ozone

Ozone (O_3) is not directly emitted from any man-made source in significant quantities. In the lower atmosphere, O_3 is primarily formed by the sunlight-initiated oxidation of volatile organic compounds (VOCs) in the presence of nitrogen oxides (NO_x). The sources of VOCs are similar to those described for NO_x above, but also include other activities such as solvent use and petrol handling & distribution.

The chemical reactions do not take place instantaneously, therefore ozone measured at a particular location may have arisen from VOC and NO_x emissions many hundreds or even thousands of miles away. Maximum concentrations generally occur downwind of the source areas of the precursor pollutant emissions. Ozone irritates the airways of the lungs, increasing the symptoms of those suffering from asthma and lung diseases.

This pollutant is measured at Bleak House Station. The air quality target value for ozone is expressed as a maximum daily 8 hour mean of 120 µg m^{-3}. This value should not be exceeded more than 25 days per calendar year, averaged over 3 years. The target value was exceeded on 8 days during 2012. The maximum hourly mean was recorded as 142 µg m^{-3}, which is below the EU Information Threshold of 180 µg m^{-3} and the EU Alert Threshold of 240 µg m^{-3}.

Air Quality Objective for Ozone (Maximum Daily 8 Hour Mean)	Maximum rolling 8-hr mean (µg m-3)
120 µg m^{-3} not to be exceeded more than 25 days per calendar year, averaged over 3 years.	**142 µg m^{-3}** Target value exceeded on 8 days

SUMMARY: There was no exceedance of the Ozone objective. Although the maximum rolling 8hr mean value is above the air quality objective for ozone, it should be noted that this is reflective of a 12 month cycle, not of a three year period. The target value of less than 120µg m^{-3} averaged over three years has been achieved.

1.5 Overview of Gibraltar's non-automatic air pollution measurements

1.5.1 Lead

The majority of Lead (Pb) emissions arise from vehicles fuelled with leaded petrol. Industry, in particular secondary non-ferrous metal smelters, may contribute to emissions of lead in industrial areas, though none exist within Gibraltar. This source can become increasingly significant due to the reduction in the lead content of leaded petrol and the increasing use of unleaded petrol (leading to significant reductions in urban lead levels).

Even small amounts of lead can be harmful, especially to infants and young children. In addition, lead taken in by the mother can interfere with the health of the unborn child. Exposure has also been linked to impaired mental function, visual-motor performance and neurological damage in children, and memory and attention span.

The air quality objective for lead is 0.5µg m^{-3} measured as an annual mean to have been achieved by 2005. The 2012 annual mean was measured at 0.01µg m^{-3}.

Air Quality Objective for Lead (measured as an annual mean)	Recorded Annual Mean
0.5µg m^{-3}	**0.01µg m^{-3}**

SUMMARY: There was no exceedance of the lead annual mean objective.

Fine particles are composed of a wide range of materials arising from a variety of sources including:

- combustion sources (mainly road traffic);
- secondary particles, mainly sulphate and nitrate formed by chemical reactions in the atmosphere, and often transported from far across Europe;
- coarse particles, suspended soils and dusts (e.g. from the Sahara), sea salt, biological particles and particles from construction work.

Particles are measured in a number of different size fractions according to their mean aerodynamic diameter. Most of the monitoring requirements are currently focused on PM_{10}, but the finer fractions such as $PM_{2.5}$ and PM_1 are becoming of increasing interest in terms of health effects. Fine particles can be carried deep into the lungs where they can cause inflammation and a worsening of the condition of people with heart and lung diseases. In addition, they may carry surface-absorbed carcinogenic compounds into the lungs.

1.5.2 Particulate Matter (PM_{10})

There are two air quality objectives set for particulate matter (measured as the PM_{10} size fraction) - a daily mean objective and an annual mean objective.

The annual mean air quality objective for PM10 is 40µg m^{-3}, the daily mean objective is set at 50 µg m^{-3}, not to be exceeded on more than 35 days per year. These objectives were to be met by 2005. The 2012 corrected annual mean was measured as 34.0 µg m^{-3} and the daily mean of 50 µg m^{-3} was exceeded on 18 occasions.

Air Quality Objective for PM_{10} (measured as an annual mean)	Recorded Annual Mean
40 µg m^{-3}	**34 µg m^{-3}**
Air Quality Objective for PM_{10} (measured as a daily mean)	No. of exceedances of maximum daily mean
50 µg m^{-3} not to be exceeded more than 35 times in a year	18

SUMMARY: The daily limit values have not been exceeded in 2012 as only 18 exceedances of the 35 permitted were recorded. The air quality objective for PM_{10}, measured as an annual mean was achieved.

Table 1.11 PM_{10} Statistics for Rosia Road

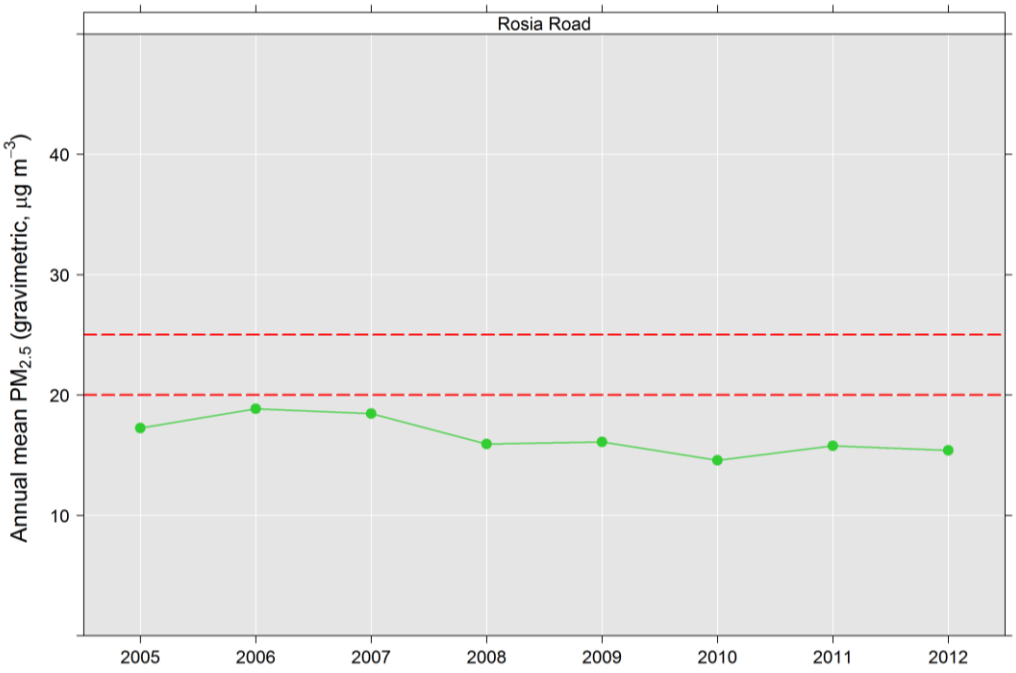
	2006	2007	2008	2009	2010	2011	2012
Valid Days of Data	362	362	330	356	347	311	329
% Data Capture	99	99	90	98	95	85	90
Annual Mean PM_{10} (40 µg m^{-3})*	39.7	45	41	38.2	40.6	34	34
Max. 24-hour mean PM_{10}	91.9	249.8	179	79	130	65	83
Days > 50 µg m^{-3} (35 day limit)*	61	109	63	37	64	25	18

* Limit values – annual mean and maximum number of days; daily limit value can be exceeded.

1.5.3 Particulate Matter ($PM_{2.5}$)

Particulate matter $PM_{2.5}$ was measured at the Rosia Road station in compliance with Part 4 of the Environment (Air Quality Standards) Regulations 2011. The annual mean was measured at 15.0 µg m^{-3}, a reduction of 1 µg m^{-3} in comparison to 2011.

Graph 1.4: $PM_{2.5}$ concentrations from 2005 to 2012



1.5.4 Arsenic, Cadmium, Nickel & Poly Aromatic Hydrocarbons (measured as Benzo(a)pyrene)

Evidence suggests that there is no identifiable threshold below which these substances do not pose a risk to human health. Impact on human health and the environment occurs via concentrations in ambient air and via deposition. The major sources of these metals in the Gibraltar region are likely to be shipping and power generation. Target values are set with the aim of minimising the harmful effects of airborne arsenic, cadmium and nickel on human health, paying particular attention to sensitive populations, and the environment as a whole.

Polycyclic Aromatic Hydrocarbons are toxic organic micro pollutants (TOMPS) that cause a wide range of effects, from cancer to reduced immunity to nervous system disorders that interfere with child development. There is no "threshold" dose - the tiniest amount can cause damage. Target values are set with the aim of minimising the harmful effects of airborne Polycyclic Aromatic Hydrocarbons on human health, paying particular attention to sensitive populations, and the environment as a whole. Benzo[a]pyrene is used as a marker for the carcinogenic risk of polycyclic aromatic hydrocarbons in ambient air. Monitoring in Gibraltar began in late 2005.

Table 1.12: Pollutants regulated by the 4th Daughter Directive

Pollutant	Parameter	Target Value	Recorded Average
Arsenic	Annual average	6 ng m^{-3}	1.14 ng m^{-3}
Cadmium	Annual average	5 ng m^{-3}	0.49 ng m^{-3}
Nickel	Annual average	20 ng m^{-3}	29.09 ng m^{-3}
BAP	Annual average	1 ng m^{-3}	0.10 ng m^{-3}

The annual averages recorded reveal that arsenic, cadmium, and poly aromatic hydrocarbons are well below their corresponding target values in 2012. However nickel has exceeded the target value by 9.09 ng m-3. Due to the historically high regional levels of nickel in the Gibraltar Bay area and the wider region it has not been possible to pinpoint the source or the cause for the nickel exceedances during 2012. In an effort to improve the

heavy metal datasets and increase network monitoring capabilities, as of 2014 metals will also be monitored at the Bleak house site. At the same time in order to improve monitoring sensitivity the schedule for metals analysis will be reorganised so that the concentrations are more frequently monitored throughout the year.

1.6 Diffusion Tube Networks

Diffusion tube samplers are used to measure nitrogen dioxide (NO_2) and hydrocarbons across Gibraltar. Monitoring sites were selected to include areas likely to be affected by specific emission sources (such as heavy traffic, power generation plants, petrol stations, or vents from fuel storage), as well as general background locations.

NO_2 and hydrocarbon (BTEX) diffusion tubes are exposed for 4-week periods and are bias adjusted using data from co-location studies carried out at Rosia Road, Witham's Road and Bleak House. The precision of NO_2 and BTEX tubes was high and the accuracy was within the expected range for an indicative method such as diffusive samplers (+/-25%).

1.6.1 Summary of Hydrocarbon Results

A summary of 2012 annual average hydrocarbon concentrations is shown in Table 1.13. Bias adjustment factors derived from the co-location study at Rosia Road have been applied to these annual means.

Table 1.13 Average hydrocarbon concentrations

Code	Site	Conc. (µg m^{-3})
GIB20	Sundial Roundabout	1.7
GIB5	Glacis Road	1.3
GIB4	Devils Tower Road	0.7
GIB1	Rosia Road	1.7
GIB3	Jumpers	1.7
GIB17	Kings Lines Fuel Depot	0.9

GIB19	North Mole	1.2
GIB30	Governors Meadow House	1.2
GIB7	Harbour Views	0.7
GIB21	Anchorage Rosia Road	0.7
GIB6	Queensway	1.5
GIB18	Moorish Castle Estate	1
GIB16	Laguna Estate	0.7
GIB2	Bleak House	0.7
GIB15	Catalan Bay Road	0.6

Annual mean benzene levels across Gibraltar in 2012 are shown in Figure 1.2. The concentrations measured were between 0.6 µg m^{-3} and 1.7 µg m^{-3}. Background concentrations at Bleak House and Catalan Bay Road were 0.7 µg m^{-3} and 0.6 µg m^{-3} respectively. During 2012 the highest levels were measured at Rosia Road (1.7µg m^{-3}), at the Sundial Roundabout (1.7 µg m^{-3}), and Jumpers (1.7 µg m^{-3}), these sites are exposed to high volumes of traffic due to frontier congestion and new traffic circulation patterns as a result of the reopening of Dudley Ward tunnel.

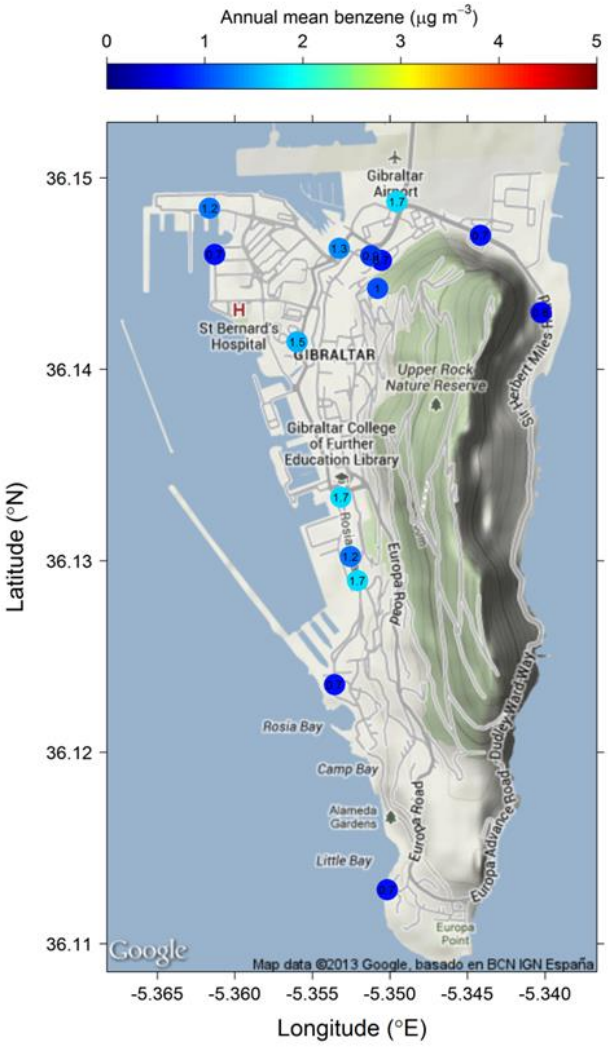


Figure 1.2 Annual mean benzene levels

- No sites had annual mean benzene concentrations greater than the EC Limit Value or Gibraltar Air Quality Objective of 5 µg m^{-3} in 2012.
- The highest levels of benzene were measured at the Sundial Roundabout, indicative of the increased traffic flow towards Dudley Ward tunnel due to frontier queues.
- The highest annual mean benzene concentration was 1.7 µg m^{-3} measured at the Sundial Roundabout, Rosia and Jumpers sites, followed by 1.5 µg m^{-3} measured at Queensway. At all other sites the annual mean benzene concentration was 1.3 µg m^{-3} or less.
- Overall, results from the non-automatic network survey in 2012 are consistent with those obtained during the 2005-2011 surveys.

1.6.2 Nitrogen Dioxide Network

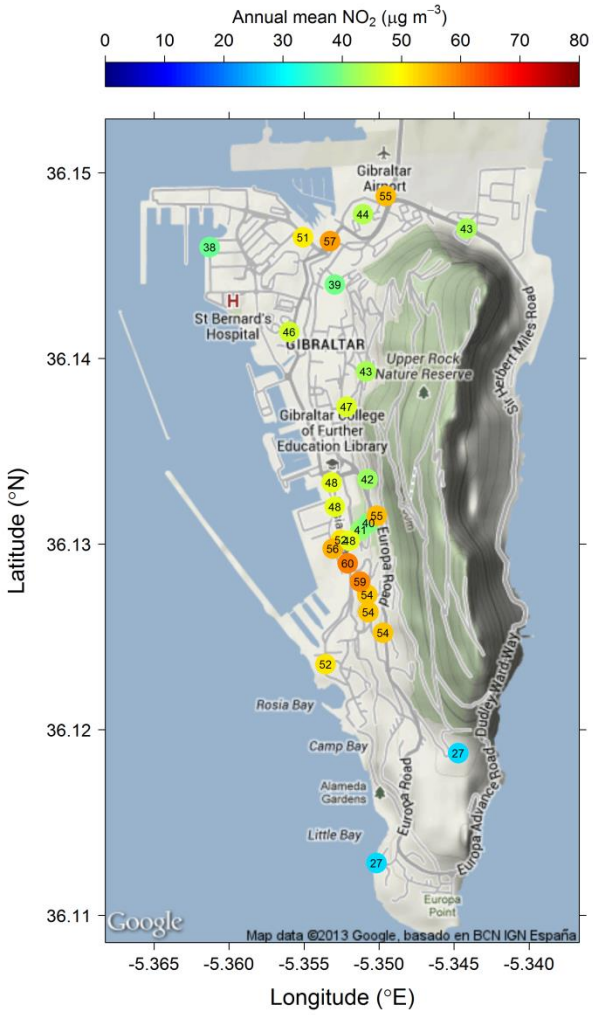


Figure 1.3 - NO_2 annual average concentrations for 2012

Annual mean NO_2 concentrations for 2012 range from 42 µg m^{-3} to 60 µg m^{-3} at kerbside sites, 46 µg m^{-3} to 52 µg m^{-3} at roadside sites and 27 µg m^{-3} to 40 µg m^{-3} at background sites.

The highest annual mean concentration (60 µg m^{-3}) was measured at Jumpers followed by Churchill House (59 µg m^{-3}) and the Glacis road site (57 µg m^{-3}). As can be seen in Table 1.14, other sites geographically close to these also exhibited elevated concentrations of NO_2.

Table 1.14: Annual Mean NO_2 Concentrations in Gibraltar 2012

Code	Site	Conc. (µg m^{-3})
GIB3	Jumpers	60
GIB31	Dockyard Road	56
GIB25	Churchill House	59
GIB10	South Barracks Road	54
GIB5	Glacis Road	57
GIB20	Sundial Roundabout	55
GIB32	Woodford Cottage	54
GIB4	Devils Tower Road	43
GIB24	Upper Witham's Entrance	54
GIB30	Governors Meadow House	52
GIB8	Red Sands Road	48
GIB28	Rock Hotel	55
GIB21	Anchorage Rosia Road	52
GIB22	Rosia Promenade	48
GIB12	Water Gardens	51
GIB14	Prince Edwards Road	47
GIB1	Rosia Road	48
GIB9	Lime Kiln Road	43
GIB13	George Don House	44
GIB26	Alameda Gardens Theatre	41
GIB7	Harbour Views	38
GIB29	Gardiners Road	42
GIB27	Alameda Gardens Access Road	40
GIB6	Queensway	46
GIB11	Main Street	39
GIB23	Lathbury Industrial Park	27
GIB2	Bleak House	27

Background concentrations of NO_2 fluctuate across Gibraltar with the highest concentrations around the Jumpers, Churchill House and the Glacis Road sampling locations.

These are indicative of the proximity to the electricity generating stations and high volumes of vehicular traffic in comparison to the typically secluded sampling points at Lathbury Industrial Park and Bleak House. The number of sites which were greater than, or equal to, the EU annual mean Limit Value of 40µg m^{-3} for NO_2 concentrations increased during 2012 versus 2011, and stood at 23 sites in comparison with 21 sites in 2011.

1.7 Conclusions & Recommendations

The Ratified Data for the automatic air pollution monitoring network shows that there were no exceedances of the carbon monoxide, sulphur dioxide, ozone and benzene objectives contained in our national legislation or within the European Air Quality Directives.

Nitrogen dioxide exceeded the annual mean objective of 40 µg m^{-3} at both Witham's Road and Rosia Road. The annual mean at Rosia Road automatic monitoring station was 46 µg m^{-3}, a decrease of 3 µg m^{-3} from 2011. The annual mean for 2012 was therefore exceeded at this monitoring station. The annual mean at Witham's Road monitoring station was 54 µg m^{-3} a decrease of 2 µg m^{-3} from 2011, maintaining the station's annual mean above the targeted annual mean of 40 µg m^{-3}. The NO_2 TEN application was submitted in 2010 and it was subsequently granted in 2011 on the understanding that the Gibraltar Air Quality Action Plan would be implemented. Data provided by the nitrogen dioxide diffusion tube network in the south district, especially around the Jumpers area, and the monitoring station at Witham's Road confirm that elevated nitrogen dioxide levels are the result of emissions from the OESCO and ISGS power stations. Modelling carried out previously also confirmed that these elevated levels are attributable to these power stations. It is expected that the closure of these stations in the future will facilitate compliance with the Directive. The closure of these two stations and the building of a modern and cleaner power station formed the basis of the TEN application. Emissions from vehicular traffic are also a significant contributing source to this area, it is anticipated that the 2013 traffic study will present alternative commuting patterns and promote increased reliance on public

transportation to improve general air quality which will have to be tackled to ensure future compliance.

During 2012, Gibraltar did not exceed the particulate matter (PM_{10}) annual mean or the 24 hour mean, this continues improvement from 2001, in contrast to 2010 where national and European Limit Values were breached for the 24 hour mean, and illustrates the on-going improvements generated under the Air Quality Action plan of 2010 as well as the introduction and implementation of the Environment (Control of Dust) Regulations 2010.

The Environmental Agency has been working in close cooperation with the Building Sector and related industries in advising them on dust control methods.

The ratified data also showed that there were no exceedances of Lead, Cadmium, Arsenic, and Poly Aromatic Hydrocarbons. However nickel has exceeded the target value by 9.09 ng m-3. Due to the historically high regional levels of nickel in the Gibraltar Bay area and the wider region it has not been possible to pinpoint the source or the cause for the nickel exceedances during 2012. In an effort to improve the heavy metal datasets and increase network monitoring capabilities, as of 2014 metals will also be monitored at the Bleak house site. At the same time in order to improve monitoring sensitivity the schedule for metals analysis will be reorganised so that the concentrations are more frequently monitored throughout the year.

Chapter 2

Natural Resources

Natural resources are materials such as minerals, timber and water that occur in nature and which have an economical value. Natural resources, such as water and air, are also essential for the survival of all living things. Essentially all manmade products are in some way or another derived from natural resources. Natural resources are therefore vital for all life on earth, and it is for this reason that the conservation and protection of such resources is important. Water is perhaps the most widely used natural resource locally. Gibraltar, being surrounded by water, produces all of its potable water supply directly from the sea.

2.1 Bathing Water

Water is a precious natural resource, which we have to manage and protect with care. The EU's efforts to ensure clean bathing water date back to the 1970's. The 1976 Bathing Water Directive is being replaced by the 2006 Bathing Water Directive and will be repealed in its entirety in 2014.

Bathing water in Gibraltar refers to coastal waters (beaches), but can also include rivers and lakes. The new Bathing Water Directive, which was transposed through the Environment (Quality of Bathing Water) Regulations 2009, deals with:-

- Monitoring, assessment and classification of bathing water quality. This classification is divided into excellent, good, sufficient and poor quality and all of these are linked to clear numerical quality standards based on bacteriological parameters. These classifications have to be in place by the end of the 2015 bathing season.
- Bathing water profiles that describe the bathing waters and explain the potential impacts and threats to water quality. These will provide information about the bathing waters to citizens and will serve as a management tool for authorities managing those waters. The first profiles were compiled during 2011.
- Measures that have to be taken in exceptional circumstances that impact bathing water quality including information to the public.
- Checks and information on various pollutants that affect bathing water quality.
- Cooperation in the management of water shared between different Member States.

Gibraltar has six bathing areas, Camp Bay, Catalan Bay, Eastern Beach, Little Bay, Sandy Bay and Western Beach. These areas are monitored on a weekly basis throughout the year. The EU minimum requirement is for fortnightly samples but Gibraltar is sampling more often than this requirement. Western Beach and Eastern Beach have a stricter sampling routine and are sampled more frequently by the Environmental Agency.

Beaches in Gibraltar have always met the Mandatory Values and some of them have met the more stringent Guide Values consistently each year. This year, results of samples taken from Western Beach have again shown that the quality of the water has suffered

deterioration and has failed to meet the Mandatory Values on several occasions. This was attributed to discharges from a storm drain by the municipal authorities in Spain which services La Linea. This drain acts as a combined sewage/storm water overflow which discharges into the area adjacent to Western Beach.

Table 2.1 – Bathing Water samples taken in 2012

Name	No of samples
Camp Bay	**28**
Catalan Bay	**28**
Eastern Beach	**42**
Little Bay	**28**
Sandy Bay	**28**
Western Beach	**80**

Table 2.2 – Bathing Water quality for all beaches

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Camp Bay												
Catalan Bay												
Eastern Beach												
Little Bay												
Sandy Bay												
Western Beach												

Meets Guide Values set by National legislation and EEC Directive 76/160/EEC

Meets Mandatory Values set by National legislation and EEC Directive 76/160/EEC

Fails Mandatory Values set by National legislation and EEC Directive 76/160/EEC

The annual Bathing Water Report and Tourist Atlas for all EU bathing water can be viewed at http://ec.europa.eu/water/water-bathing/index_en.html. Further information on bathing waters can be found at Water Information System for Europe (WISE) http://www.eea.europa.eu/themes/water.

2.2 Potable Water Supply

AquaGib Ltd produces all of its potable water through desalination. Potable water is produced at two separate locations within Gibraltar. One plant is located at Governor's Cottage, which consists of four Reverse Osmosis Desalination Plants capable of a maximum production of 4,800 cm^3/day. The second is located at Waterport and consists of one Reverse Osmosis plant capable of a maximum production of 1,500 cm^3/day.

The Public Health Act Part III is the main piece of legislation that controls the supply and quality of potable water in Gibraltar. The Schedules of the Public Health (Potable Water) Rules 1994 contain the microbiological and chemical parameters to which potable water must adhere.

Water quality is checked under a two tier sampling and analysis programme carried out throughout the year by both the Environmental Agency and AquaGib Ltd.

a) The Environmental Agency carries out its own independent monitoring programme taking samples at consumers' taps. This programme is designed to meet the sampling criteria outlined in the Drinking Water Directive (DWD) 98/83/EC and national legislation.
b) AquaGib Ltd has its own "in house" water quality programme and also sends samples to laboratories in the United Kingdom. Samples are taken throughout production, storage at service reservoirs, control points and consumer taps.

In 2012, AquaGib Ltd produced 1,491.542.00 m^3 potable water through the Reverse Osmosis Plants at Governor's Cottage. "Check" and "Audit" monitoring were carried out in accordance with EC 98/83/EC and the Public Health (Potable Water) Rules 1994.

The purpose of the "check" monitoring is –

- To provide information on the organoleptic and microbiological quality of the water.
- To test the effectiveness of the water treatment.
- To the check whether the water complies with the relevant parametric values laid down by the Directive and national legislation.

The following parameters are included in the “check” monitoring carried out by the Environmental Agency:-

- Odour
- Taste
- Colour
- Turbidity
- pH
- Conductivity
- Ammonium
- Hardness
- Chloride
- Residual Chlorine
- Total Coliforms
- Faecal Coliforms

The legislation requires that a minimum of 16 samples and a further 3 audit samples are undertaken in a given year taking into consideration the total volume of water produced. The Environmental Agency and AquaGib Ltd jointly took a total of 245 “check” and 6 audit “audit” samples during 2012.

The following table shows the number of samples taken in Gibraltar:-

Table 2.3 National summary information on drinking water quality in water supply zones exceeding 1000 m^3 per day as an average or serving more than 5000 persons

Member State	United kingdom (Gibraltar)				
Year	2012				
Parameter	Numbers of WSZ Monitored	Numbers of WSZ with Non-Compliance	Number of Analyses	Number of Analyses not complying	% of Analyses Complying
Microbiological Parameters					
Escherichia (E.coli)	1	0	119	0	100
Enterococci	1	0	142	0	100
Chemical Parameters					
Aluminium	1	0	6	0	100
Antimony	1	0	6	0	100
Arsenic	1	0	6	0	100
Benzene	1	0	6	0	100
Benzo(a)pyrene	1	0	6	0	100
Boron	1	0	6	0	100
Bromate	1	0	6	0	100
Cadmium	1	0	6	0	100
Chromium	1	0	6	0	100
Colour[3]	1	0	251	1	0.39
Copper	1	0	6	0	100
Cyanide	1	0	6	0	100
1,2-dichloroethane	1	0	6	0	100
Fluoride	1	0	6	0	100
Iron	1	0	6	1	83.3
Lead	1	0	6	0	100
Manganese	1	0	6	0	100
Mercury	1	0	6	0	100
Nickel	1	0	6	0	100
Nitrite in distribution at the tap	1	0	6	0	100
Nitrate/nitrite formula[3]	1	0	6	0	100
Odour[3]	1	0	238	0	100
Pesticides-individual[2]	1	0	0	0	100
Pesticides – total	1	0	6	0	100
Polycyclic Aromatic Hydrocarbons	1	0	6	0	100
Selenium	1	0	6	0	100
Sodium	1	0	6	0	100

Taste$_3$	1	0	238	0	100
Tetrachloroethane and Trichloroethane	1	0	12	0	100
Trihalomethanes - Total	1	0	6	0	100

			Indicator Parameters		
Ammonium	1	0	247	0	100
Chloride	1	0	251	0	100
Clostridium perfringens	1	0	136	0	100
Conductivity	1	0	246	0	100
Sulphate	1	0	6	0	100

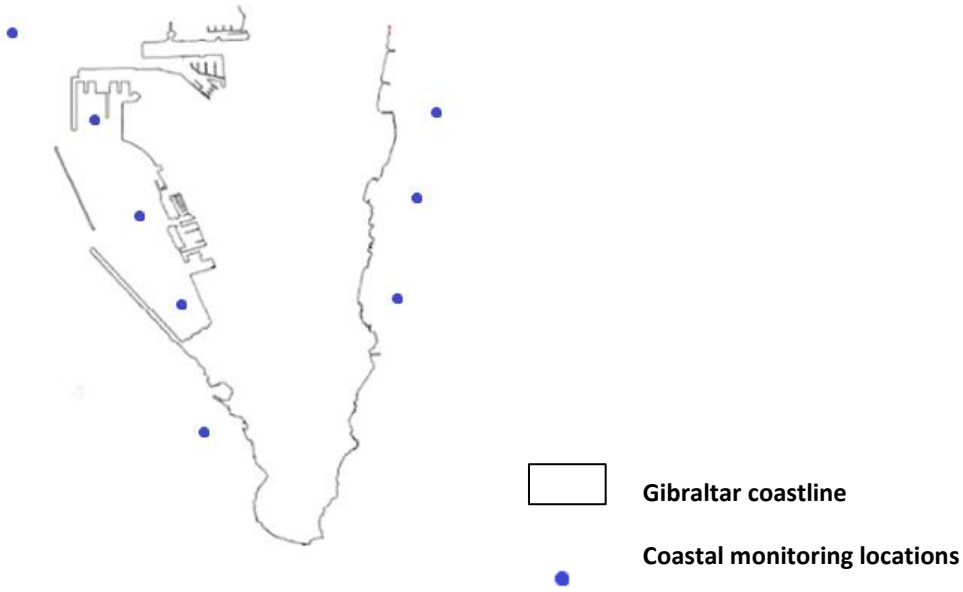
2.3 Coastal Water Sampling

In order to comply with the requirements of the Water Framework Directive (WFD) 2000/60/EC requirements, good chemical and ecological status should be attained and maintained in Gibraltar coastal and ground waters by 2015. As part of the water quality monitoring, the Department of the Environment has been undertaking chemical water quality and phytoplankton analysis in its coastal waters since July 2009. Groundwater monitoring was previously carried out by AquaGib Ltd under contract to the Department of the Environment. As from this year, the Department of the Environment will be carrying out groundwater monitoring. This section of the annual report provides an overview of the data collected so far.

2.3.1 Coastal Water monitoring

Sea water samples were collected for water quality analysis of the coastal waters of Gibraltar within 500m of the shoreline (fig 2.1). Before 2010, four sampling sites were chosen around the coast of Gibraltar and these were increased to eight in 2011. These consist of four core sites and four additional investigative sites, two of which are located within the harbour, and two of which are located at the eastside of Gibraltar.

Figure 2.1 Coastal water sampling locations



The two additional investigative sites within the harbour were included in the programme to monitor levels of tributyltin. Tributyltin (TBT) is an active compound found in vessel antifouling paint and is considered to be a toxic chemical having negative effects on human health and the environment. The two additional sites located on the eastside of Gibraltar were included in the programme in order to monitor chemical/physio-chemical parameters in the coastal areas within the vicinity of the eastside reclamation.

Table 2.4 Chemical/Physio-chemical parameters measured

Chemical / physio-chemical parameters	*Frequency*
General	**Monthly**
Temperature	**Monthly**
Nutrient status - Total N, Total P, NO3, NO2, NH4, PO4	**Monthly**
Salinity	**Monthly**
Total suspended solids	**Monthly**
Dissolved |Oxygen (DO)*	**Monthly**
Transparency*	**Monthly**
Chlorophyll-a*	**Monthly**

pH*	**Monthly**
Specific pollutants	
Pesticides	
Alachlor	**4 times per year**
Atrazine	**4 times per year**
Chlorfenvinphos	**4 times per year**
Chlorpyrifos	**4 times per year**
Endosulfan (alpha-endosulfan)	**4 times per year**
Hexachlorobutadiene	**4 times per year**
Hexachlorocyclohexane	**4 times per year**
(gamma-isomer, Lindane)	**4 times per year**
Simazine	**4 times per year**
Trifluralin	**4 times per year**
Metals	**4 times per year**
Cadmium and its compounds	**4 times per year**
Lead and its compounds	**4 times per year**
Mercury and its compounds	**4 times per year**
Nickel and its compounds	**4 times per year**
Polyaromatic hydrocarbons	
Anthracene	**4 times per year**
Fluoranthene	**4 times per year**
Naphthalene	**4 times per year**
(Benzo(a)pyrene)	**4 times per year**
(Benzo(b)fluoranthene)	**4 times per year**
(Benzo(g,h,i)perylene)	**4 times per year**
(Benzo(k)fluoranthene)	**4 times per year**
(Indeno(1,2,3-cd)pyrene)	**4 times per year**
Chlorinated Hydrocarbons	**4 times per year**
1,2-Dichloroethane	**4 times per year**
Dichloromethane	**4 times per year**
Hexachlorobenzene	**4 times per year**
Pentachlorobenzene	**4 times per year**
Trichlorobenzenes (1,2,4-Trichlorobenzene)	**4 times per year**
Trichloromethane (Chloroform)	**4 times per year**
TBT	
Tributyltin compounds (Tributyltin-cation)	**4 times per year**

Other hydrocarbons	**4 times per year**
C10-13-chloroalkanes	**4 times per year**
Benzene	**4 times per year**
BDEs	
Brominated diphenylethers	**4 times per year**
DEHP	
Di(2-ethylhexyl)phthalate	**4 times per year**
Urons	
Diuron	**4 times per year**
Isoproturon	**4 times per year**
Phenols	
Nonylphenols (4-(para)-nonylphenol)	**4 times per year**
Octylphenols (para-tert-octylphenol)	**4 times per year**
Pentachlorophenol	**4 times per year**
Other pollutants	
Chromium	**4 times per year**
Copper	**4 times per year**
Zinc	**4 times per year**
Biological parameters	
Phytoplankton - Abundance & composition (Abn. & Comp.)	**4 times per year**
Benthic macroinvertebrates - Abundance, composition & biomass	**Every 6 years**

These results have fed into the creation of the Gibraltar River Basin management Plan which can be found online in the publications section of the Department of the Environment webpage.

Analysis of the samples collected is carried out by AMEC Environment and Infrastructure Limited. Examination of the samples collected during 2012 indicate that –

- Dissolved oxygen concentration for the coastal waters and Heavily Modified Water Bodies (HMWB) continues to be compliant with high status indicating that there are no adverse impacts from sewage discharges in the coastal waters and harbour area. The harbour area is designated as a HMWB under the Water Framework Directive.

- Dissolved Inorganic Nitrogen (DIN) for the coastal waters and HMWB continue to be compliant with at least good status, and most likely high status, indicating that there are no adverse impacts from nutrients from Gibraltar or adjacent territories.

- No pesticides or herbicides were detected at any of the sampling points.

- 90%ile values for chlorophyll at all sites are compliant with thresholds values set out in the Intercalibration Report (2008/915/EC) for type IIA waters (western Mediterranean basin influenced by freshwater).

2.3.2 Sediment monitoring programme

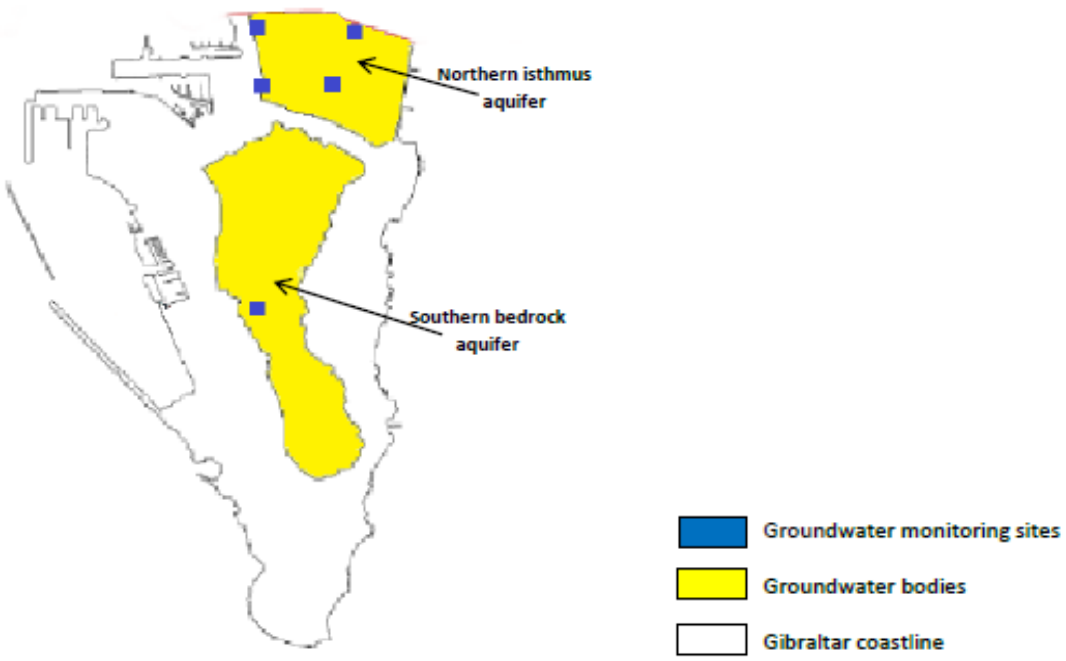
The sediment monitoring programme was started in 2011. The locations used are the same as those used for the Coastal Water Monitoring Programme (Fig 2.1). Van Veen Grabs (Fig 2.2) are used to obtain the samples from the seabed. The samples are stored in glass containers and sent to the UK for analysis within 48 hours of their collection.

Figure 2.2 Van Veen Grab used for collecting sediment samples

2.3.3 Groundwater monitoring programme

Figure 2.3 provides an overview of the monitoring locations that form part of the Groundwater Monitoring Programme. There are currently 4 monitoring points in the Northern Isthmus aquifer. Historically, Gibraltar has abstracted a proportion (up to 12%) of its total water supply from this aquifer. There is also 1 monitoring point in the Southern bedrock aquifer, although the intention for the future is to increase this to 3 monitoring points. This aquifer is recharged by rainfall percolating through the limestone bedrock as opposed to the Northern aquifer, which is predominantly recharged from the Sierra Carbonera district in the neighbouring Spain.

Figure 2.3 Monitoring locations in the Northern Isthmus and Southern bedrock aquifers



A wide range of heavy metals, hydrocarbons and pesticides are monitored on a quarterly basis from each of the monitoring points. Additional in-situ measurements, including water level (quantitative) measurements, are taken from each monitoring point to aid the water quality classification of Gibraltar's groundwaters. No exceedences in the chemical parameters monitored have been observed so far for the Northern Isthmus or Southern Bedrock Aquifers.

Chapter 3

Habitats

A habitat is an ecological area that is inhabited by a particular species of plant, animal or other type of organism. Habitats vary in size and are regarded as a natural home or environment for different types of organisms. Gibraltar is home to different habitats which support a diverse range of wildlife. Given its size, this variety of habitats and wildlife make Gibraltar a truly unique place. The management and protection of habitats is very important and vital for the continued survival of species of plants and animals found in Gibraltar.

3.1 Habitats

The EC Habitats Directive 92/43/EEC requires that Member States afford protection for certain species and habitats through the creation of European Sites (Sites of Community Importance (SCI) and Special Areas of Conservation (SAC). The information contained in this chapter has been sourced from the Report on the Conservation of Terrestrial Flora & Fauna in Gibraltar 2012 (Wildlife (Gibraltar) Ltd), as well as the Southern Waters of Gibraltar Management Scheme.

3.1.1 Upper Rock Nature Reserve

The Nature Conservation Area was extended on the 24th November 2011 under the Nature Conservation Area (Extension of the Upper Rock) Designation Order 2011 to include the Europa Foreshore, cliff habitat extending from Little Bay to Governor's Beach, Jacobs Ladder, Hole in the wall and vegetated areas along the cliff to the east of the Naval Hospital. The area was extended to include the main large stands of the Gibraltar Candytuft (*Iberis Gibraltarica)* and the Gibraltar Sea Lavender (*Limonium emarginatum)*, both species protected under the Nature Conservation Act (1991).

Figure 3.1 Extension of the Upper Rock Nature Reserve

3.1.2 Birds

3.1.2 (a) Nesting Birds of Prey Survey

The Gibraltar Ornithological and Natural History Society (GONHS) conduct surveys of birds of prey during the breeding season. The GONHS Bird of Prey Unit now surveys four species annually. These are the Peregrine *Falco peregrinus*, Common Kestrel *(Falco tinnunculus)*, Lesser Kestrel (*Falco naumanni)* and Little Owl *(Athene noctua)*. The Tawny Owl *(Strix aluco)* and Eagle Owl *(Bubo bubo)* are also present in Gibraltar and sightings of these species are recorded. The Peregrine, Lesser Kestrel and Eagle Owl are included in Annex I of the Birds Directive. Most of the nesting sites of these species lie within the boundaries of the terrestrial SCI.

3.1.2 (b) Lesser Kestrel

There is a colony of Lesser Kestrel located at the north face of the Rock. This colony has fledged 35 chicks, with all thirteen pairs producing young. Although this colony has produced 31 young, there has been a drop in pairs from 18 recorded in 2011 to 13 pairs recorded in 2012. Nests continue to be taken by Feral Pigeons and the continued survival of the colony is uncertain.

A captive breeding programme was started in 2011 by the GONHS Raptor Unit (in accordance with recommendations in the Gibraltar Biodiversity Action Plan 2006). 2 rehabilitated males and 3 females were used producing 7 fledging's, of which 5 were released to the wild and 2 were kept for captive breeding purposes. In 2012, 3 pairs were used in the programme and these produced 11 young, with 7 released back to the wild.

3.1.2 (c) Common Kestrel

Common Kestrels raised a minimum of 26 young from a minimum of 8 occupied nests. This shows a slight decrease when compared to previous years (Table 3.1). The most successful pairs were those from the Mediterranean Steps and Laguna Estate, which reared 5 young each. 4 young were fledged at nests located opposite St. Theresa's Church and Both Worlds, with 3 from the north face and Catalan Bay. The pair located in the Moorish Castle raised 2

young and there was a further pair at Devil's Gap Battery, but breeding success was not confirmed.

Table 3.1 Pairs of Lesser Kestrel and Common Kestrel found in Gibraltar

YEAR	LESSER KESTREL	COMMON KESTREL
2001	9	8
2002	9	9
2003	7	10
2004	9	10
2005	14	10
2006	15	10
2007	19	11
2008	21	11
2009	15	10
2010	16	11
2011	18	9
2012	13	8

3.1.2 (d) Peregrine

Peregrines only managed to raise 8 young, after a marked increase last year when they raised 14, following a low of 7 the previous year. The number of young raised in 2012 is well below the mean of 13.6 young per annum since 2000 (Table 3.2). This drop can be attributed to disturbance as a possible factor. The possible relocation of the Eagle Owl to the Mediterranean Steps area may also have contributed to this decline. Only 4 pairs raised these 8 eight young, with the pair from the Mediterranean Steps now absent for the second year running (only the male is present).

Table 3.2 Breeding success of Peregrines in Gibraltar

YEAR	NORTH FACE	CATALAN BAY	BOTH WORLDS	OIL TANKS	MED STEPS	CAMP BAY	MOSQUE	TOTAL
2001	4	2	2	2	3	0		13
2002	5	0	0	2	6	0		13
2003	4	0	0	3	5	0		12
2004	2	0	0	3	4	4		13
2005	2	0	0	2	2	3	0	9
2006	2	2	3	3	4	4	5	23
2007	3	0	3	2	0	1	3	12
2008	3	3	3	4	0	1	3	17
2009	2	2	4	3	3	4	2	20
2010	0	0	3	2	0	2	0	7
2011	2	3	3	0		3	3	14
2012	0	3	2	0		1	2	8

3.1.2 (e) Little Owl

The Little Owl is Gibraltar's most common nocturnal bird of prey. Its habitats, however, make monitoring very difficult. Vocalisations facilitate location of most pairs' holding territory and the species was included in the surveys for the first time in 2010. Breeding success is extremely difficult to gauge accurately, although young were recorded at 3 sites. 9 nest sites were identified, but only single young were seen at the 3 sites: Catalan Bay, Both Worlds and Laguna Estate.

3.1.2 (f) Tawny Owl

There is a small population of Tawny Owls in the Gibraltar Botanic Gardens and South District gardens. It is thought that use of rat poison within the area of Witham's Cemetery have impacted this small population. There were 2 winter records of Tawny Owls: one seen on the 1st January at the Observatory at Jew's Gate and another in the old PSA Nursery on the 31st January. The only other record was an individual that was seen at close quarters in poor condition at the Alameda on the 13th and 15th October, both times drinking in broad daylight and looking poorly. It was subsequently picked up dead on the 17th October

showing signs that it might have ingested some harmful agent found more than likely in a rodenticide.

3.1.2 (g) Eagle Owl

The Eagle Owl was sighted on 2 occasions early in the year. The first sighting took place on the 1st February, and the other on the 12th February, when it was seen carrying a prey item, possibly a rabbit. Breeding at its usual location was not confirmed in 2012. There were reports late in the year of an Eagle Owl at the refuse compound at Hole in the Wall, probably attracted by prey items such as rats.

3.1.2 (h) Barbary Partridge

The number of Barbary Partridges recorded during 2012 was very low. Partridges were recorded on the Upper Rock roads, Jew's Gate and the Rock Gun area in late February and March, where pairs of birds were seen crossing the road. A single pair was also observed on Windmill Hill Flats on the 22nd February. This site was once the stronghold of the species in Gibraltar. A pair with well-developed young was seen at Middle Hill in July, the only record of successful breeding for some years. Further sightings were recorded during August and September. During this period, Barbary Partridges were seen on 5 occasions, with a maximum of 8 birds observed on the 8th September and 4 on the 29th September. A pair was seen around the area of Lathbury Barracks in December and 4 birds were observed crossing Queen's Road above Jew's Gate on the 6th December.

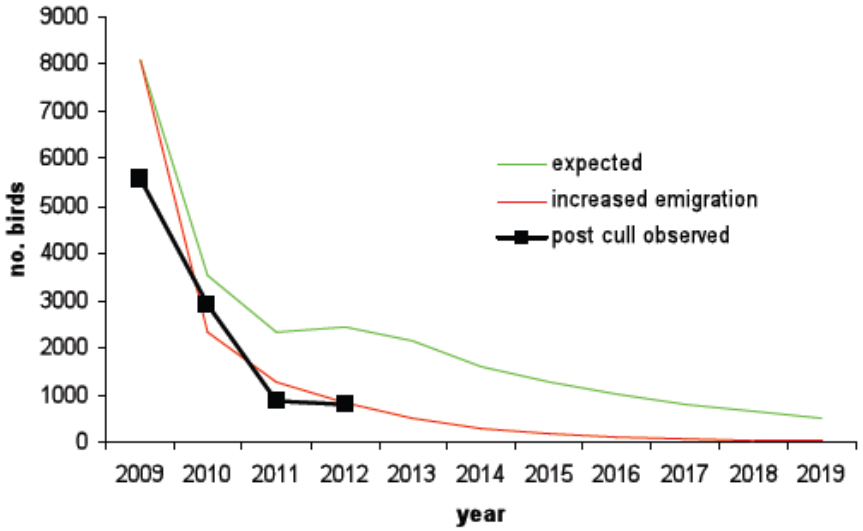
Threats to the Barbary Partridge include loss of open habitat, predation by gulls and/or cats, and the possibility of infection with avian pathogens by feral chickens and other domestic wildfowl.

3.1.2 (i) Yellow-legged Gulls

The Upper Rock Nature Reserve and the eastern sand slopes continue to be the main nesting sites for Yellow-legged Gulls. A combination of the four-year cull by the Food and Environment Research Agency (FERA) and the GONHS gull control effort has seen a continuous decline of the species nesting in Gibraltar. This was confirmed by Guillem (2009,

2010), who reported a significant decrease of the breeding Yellow-legged Gull population throughout Gibraltar from 2002-2010, including a significant decrease between 2009 and 2010.

Figure 3.2 Expected and observed declines in the gull population



The GONHS Gull Control Unit culled the species throughout the year except for the months of July, August and most of September when few gulls remain as they depart during the summer. The total number of gulls eliminated during 2012 is 3159, and 230 eggs were destroyed by the GONHS team. The FERA team, composed of 8 firearm officers, culled Yellow-legged Gulls over a six-week period from the 23rd April to the 30th May. They eliminated 2412 gulls and humanely disposed of 114 chicks and 168 eggs.

3.1.2 (j) Pigeons

A pigeon survey was carried out by the Gull Control Unit 2012 to assess population trends and distribution of Feral Pigeons in Gibraltar. The survey was conducted over a one-day period and recorded a total number of 834 pigeons. Main hotspots included: Varyl Begg Estate, GASA area, Kings Bastion, Piazza, Cathedral/the town centre, Laguna Estate, Buena Vista Barracks, St Joseph's School/Estate, Moorish Castle Estate, Mount Alvernia and Arengo's Palace area.

3.1.3 Mammals

3.1.3 (a) Barbary Macaques

The Macaque population in Gibraltar consists of 5 groups plus 4 subgroups (Table 3.3). The population at the beginning of 2012 was 183. There were 13 deaths recorded in 2012: 2 at Anglian Way, 4 at Prince Philip's Arch, 4 at Middle hill and 3 at Apes Den.

Table 3.3 Barbary Macaque groups and subgroups in 2012

GROUP	TOTAL	SUBGROUP
Middle Hill	29	Middle Hill Rock Gun Catalan Bay / Sandy bay
Prince Philip's Arch	61	Prince Philip's Arch Cable car station
Anglian Way	49	Anglian Way St Michael's Cave Europa Advance
Apes Den	36	None
Farringdon's Area	11	None

The population numbers remain stable with 186 during the last count. Breeding success resulted in 43 births, but there were 7 infant deaths as well (Table 3.4).

Table 3.4 Births and deaths of Barbary Macaques in 2012

LOCATION	BIRTHS	INFANT DEATHS	DEATHS
Middle Hill	15	2	4
Prince Philip's Arch	8	1	4
Anglian Way	8	2	2
Apes Den	11	2	3
Farringdon's area	1	0	0
TOTAL	43	7	13

3.1.3 (b) Bats

Monitoring took place up to and including September 2010, providing a two year picture of the population of Schreiber's Bats (*Miniopterus schreibersi*) at Lord Airey's tunnel. No other

sites harbouring Schreiber's Bats have been reported and this remains the only known roost for the species.

During the autumn, a few bats were sighted in Martin's Cave. Visits to the site confirmed that there were 3 bats, which were identified probably as being Mouse-eared bats (*Myotis myotis).* This species has not been recorded in Gibraltar for some time now. This species is endangered in Europe and is listed under the Annex II of the Bonn and Bern Conventions, and Annex II and IV of the Habitats Directive. Works have been completed in the area that will ensure controlled access in order to minimise disturbance.

3.1.4 (c) Hooded seal

A seal was found in the area of Coaling Island on 25th September 2012 (figure 3.3). The seal was identified as a Hooded Seal (*Cystophora cristata*), around 4 months old. It is thought that the pup had strayed from its pack and had managed to enter the port and the berths beside Coaling Island. The pup was found in a very exhausted state and had subsequently clambered onto a nearby slipway where it remained resting for the most part of the day. The Department of the Environment was immediately at the scene to ensure that the pup was not disturbed and was safe. The pup left the area at around 05:00am on 26th September 2013 after a period of heavy rainfall.

Figure 3.3 Hooded seal in Coaling Island

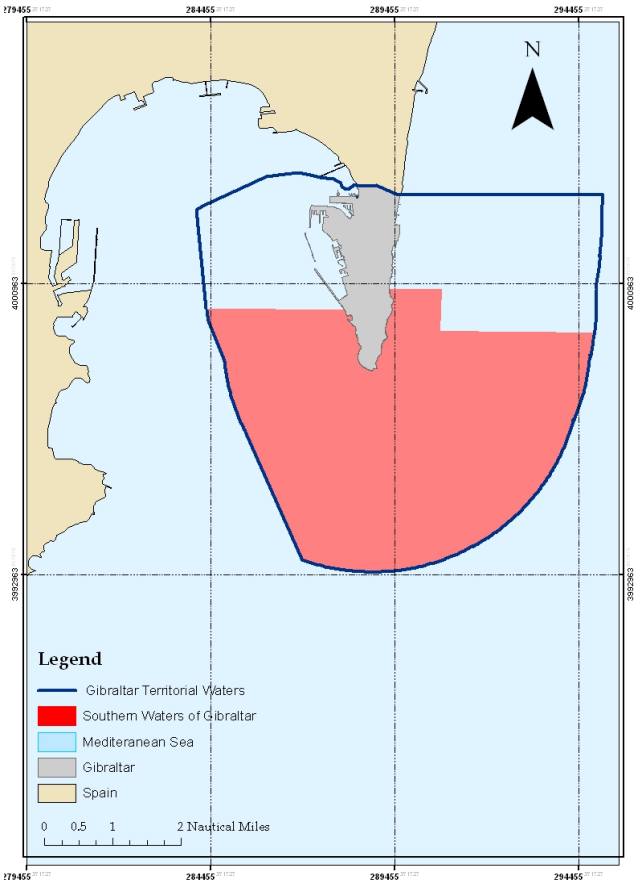
The Hooded Seal is listed as a vulnerable species under the IUCNs Red List. Hooded Seals are found at high latitudes within the North Atlantic, but are known to wander extensively. Young animals have come ashore as far south as Portugal and the Canary Islands. Sightings of hooded seals, or any other species of seal, are extremely rare in Gibraltar. As the Competent Authority, the Department of the Environment is responsible for ensuring that such species that are found in Gibraltar are not disturbed or threatened in any way.

3.2 Southern Waters of Gibraltar

In July 2006 the European Commission, through decision 2006/613/EC, accepted the UK's proposal, made at the request of the Government of Gibraltar, to list and adopt the Southern Waters of Gibraltar as a Site of Community Importance (SCI). The Government of Gibraltar, in accordance with the requirements of section 17C(1) of the Nature Protection Act 1991 and Article 4(4) of the European Commission's Habitats Directive 92/43/EC, has now designated the Southern Waters of Gibraltar SCI as a Marine Special Area of Conservation (SAC). A protection regime has been in existence since 1991 through the Nature Protection Act (1991) which is now supplemented by the Southern Waters of Gibraltar Management Scheme.

The marine SAC (Fig3.4), which extends three miles to the East and South of Gibraltar and stretches to the median line to the West of Gibraltar, has long been recognised as an important marine area due to its rich diversity of habitats and species. Sea cliffs and caves, reefs and sandy marine habitats all form part of the vast marine ecosystem found along the southern shores of Gibraltar. The abundance and richness of species found in this area is largely influenced by the strong currents and upwelling's that are characteristic of the Straits of Gibraltar.

Figure 3.4 Southern Waters of Gibraltar



3.3 Southern Waters of Gibraltar Management Scheme

This Management Scheme was created in order to enable the relevant authorities to carry out their responsibilities and functions in line with the requirements of the Nature Protection Act 1991, and with regard to the nature conservation features for which the Southern Waters of Gibraltar European Marine Site has been designated.

The Management Scheme is concerned with promoting the sustainable use of a living, working environment. It does not aim to stop people using the Southern Waters of Gibraltar or prevent leisure activities or commercial development in the area. Instead it brings together all existing management measures in place and provides a mechanism by which these can be delivered so that they do not damage the habitats or species for which the site has been designated.

The management scheme will not be a static document, but an on-going process that aids decision making and continually evolves to take account of changing issues and legal obligations. It sets out a regime to monitor the condition of the site's features and considers options to rectify any deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated.

Chapter 4

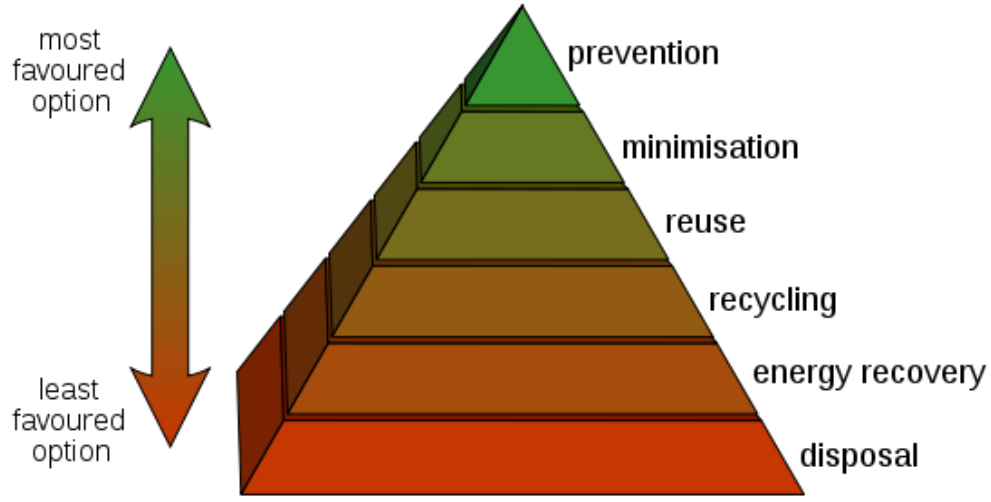
Waste Management

Waste production is a growing concern. The growth in population and financial wealth has resulted in increases in products that are consumed and, more crucially, disposed of after use. Over 1.8 billion tonnes of waste is generated by Europe each year; this is mainly made up of waste coming from households, commercial activities, industry, agriculture, construction and from the generation of energy. With such vast quantities of waste being produced, it is of vital importance that it is managed in such a way that it does not cause harm to either human health or to the environment.

4.1 Background

Since 2003 the waste management strategy for Gibraltar has involved the exportation of waste to neighbouring Member State Spain for treatment in authorised facilities. EU Directives such as the Waste Framework Directive (2008/98/EC), and the landfill Directive (1991/31/EC) aim to drive the European Community away from landfilling and instead shift the Communities waste up the waste hierarchy (Refer to Figure 4-1).

Figure 4-1: The Waste Management Hierarchy.



The Waste Framework Directive sets the concepts, definitions and targets related to waste management. It explains when waste ceases to be waste and becomes a secondary raw material (end of waste criteria). The Directive requires that Member States manage waste without endangering human health and harming the environment, in particular without risk to water, air, soil, plants or animals, without causing a nuisance through noise, odours, and without adversely affecting the countryside or places of special interest.

Gibraltar's Waste Management Plan 2011 serves the purpose of providing a framework to inform the decision making process, facilitating the efficient and sustainable waste management of all waste streams arising in Gibraltar. Information on the different waste streams and treatment options including forecasts of waste streams in the future also forms part of the Plan. This plan will be revised in 2013.

This chapter provides statistical information on Gibraltar's waste arisings as well as details of waste management policies currently in place, including details on the increased recycling facilities and the introduction of waste electrical and electronic equipment legislation (WEEE).

4.2 Industrial Waste

Due to the absence of heavy industry in Gibraltar, the main sources of industrial waste are shipping, the Ministry of Defence (MOD), light industry and clinical/medical practices. A limited amount of hazardous material is also produced from municipal sources and via construction and demolition activities.

Industrial waste materials are stored locally under strict licence conditions until sufficient quantities have been gathered to warrant their transfrontier shipment. It predominantly consists of waste oils, asbestos and asbestos containing products. A detailed breakdown of locally produced hazardous wastes during 2012 is given in Table 4 -1.

Table 4-1. Breakdown of Industrial Waste Arisings 2012

EWC CODE	DESCRIPTION	TOTAL FOR 2012	UNITS
20 01 35*	discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components	8.68	Mt
20 01 21*	fluorescent tubes and other mercury-containing waste	0.64	Mt
16 01 07*	oil filters	0.368	Mt
16 07 08*	wastes containing oil	25.72	Mt
19 08 11*	sludges containing dangerous substances from biological treatment of industrial waste water	14.58	Mt
16 02 11*	discarded equipment containing chlorofluorocarbons, HCFC, HFC	5.68	Mt
16 02 13*	discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12	163.64	Mt
13 07 03*	other fuels (including mixtures)	7996.377	Mt
13 04	bilge oils	2627.265	Mt
19 01 13*	fly ash containing dangerous substances	28.72	Mt
19 01 13*	fly ash containing dangerous substances	7.16	Mt
16 01 07*	oil filters	0.46	Mt
17 06 05*	construction materials containing asbestos	4205.94	Mt
17 03 03*	coal tar and tarred products	22.36	Mt
15 02 02*	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	14.46	Mt
13 05 02*	sludges from oil/water separators	3817.48	Mt
20 03 99	municipal wastes not otherwise specified	10186.16	Mt
17 09 03*	other construction and demolition wastes (including mixed wastes) containing dangerous substances	163.36	Mt

16 06 01*	lead batteries	33.345	Mt
18 01 03*	wastes whose collection and disposal is subject to special requirements in order to prevent infection	466.56	M³
19 01 11*	bottom ash and slag containing dangerous substances	12.7	Mt
19 01 13*	fly ash containing dangerous substances	2.45	Mt
15 02 02*	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	35.92	Mt
17 05 03*	soil and stones containing dangerous substances	8.4	Mt
13 05 02*	sludges from oil/water separators	8.1	Mt
17 06 05*	construction materials containing asbestos	42.2	Mt
16 02 13*	discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12	187940	M³
16 02 11*	discarded equipment containing chlorofluorocarbons, HCFC, HFC	31710	M³
12 01 16*	waste blasting material containing dangerous substances	2691.06	M³
08 01 11*	waste paint and varnish containing organic solvents or other dangerous substances	58.04	M³
06 01 06*	other acids	1480	M³
17 06 05*	construction materials containing asbestos	234.806	M³
13 04	bilge oils	3928.97	M³
13 02	waste engine, gear and lubricating oils	111.78	M³
13 04	bilge oils	284.48	M³
09 01 02*	water-based offset plate developer solutions	0.75	Mt
08 01 11*	waste paint and varnish containing organic solvents or other dangerous substances	8.66	M³

20 01 29*	detergents containing dangerous substances	0.2	Mt
06 03 13*	solid salts and solutions containing heavy metals	0.25	Mt
16 05 04*	gases in pressure containers (including halons) containing dangerous substances	0.953	Mt
08 03 17*	waste printing toner containing dangerous substances	520	M³
16 06 04	alkaline batteries (except 16 06 03)	1340	M³
16 06 01*	lead batteries	17.535	M³
20 03 99	municipal wastes not otherwise specified	16347.16	Mt
16 01 07*	oil filters	3080	M³
17 06 05*	construction materials containing asbestos	4080	M³
15 02 02*	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	11740	M³
13 05 02*	sludges from oil/water separators	10.04	Mt
18 01 03*	wastes whose collection and disposal is subject to special requirements in order to prevent infection	129600	M³
16 07 08*	wastes containing oil	2717.57	M³
16 06 01*	lead batteries	69.77	M³
13 07 03*	other fuels (including mixtures)	3121543.241	M³
16 01 07*	oil filters	2.575	M³
15 02 02*	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	2.962	M³
17 05 04	soil and stones other than those mentioned in 17 05 03	12964.64	Mt
16 07 08*	wastes containing oil	9107.161	M³
13 07 03*	other fuels (including mixtures)	19161.425	M³
08 03	wastes from MFSU of printing inks	3.511	M³

4.3 Municipal Waste

Municipal waste in Gibraltar is collected by Gibraltar Industrial Cleaners (GIC), a wholly owned Government company, and Master Service (Gib) Ltd, a private company.

In 2012, the total amount of municipal waste collected and sent to Spain for disposal was 26,447.94 tonnes. This includes mattresses and bulky household items as illustrated in Figure 4-2 on the following page. Removing these items from the total volumes leaves 16926.24 tonnes of refuse, equating to 569 kg per person per year. This figure highlights a marked decrease of 26kg per person during 2012 when compared to the figures for 2011. This equates to a total decrease of 764.82 tonnes of household waste generated during 2012 when compared to the figures for total refuse generated during 2011. This equates to a 5% reduction in the generation of this waste stream.

Figure 4-3 refers to the annual totals with regards to Household Bulky Items. As can be noted in the chart, 2012 saw a decrease in the amount being generated and sent to landfill. Between 2011 and 2012 there has been a marked decrease of 3464.14 tonnes. This equates to a 27% decrease in the generation of this waste stream.

Figure 4-4 refers to the annual totals with regards to the collection for disposal of mattresses. As can be seen from the chart, a marked increase in the generation of waste mattresses can be noted. Referring to the figures between 2011 and 2012, we can note an increase of 30.72 tonnes of waste mattresses. This equates to a 264% increase in the generation of this waste stream.

Table 4-2. Municipal Waste in Gibraltar in 2012

2012	REFUSE	HOUSEHOLDS (Bulky Items)	MATTRESSES	Total Refuse for Month
MONTH	Weight (TONs)	Weight (TONs)	Weight (TONs)	Weight (TONs)
JANUARY 12	**1,520.460**	**925.720**	**5.680**	**2,451.860**
FEBRUARY 12	**1,271.900**	**881.620**	**5.340**	**2,158.860**
MARCH 12	**1,346.320**	**898.540**	**3.180**	**2,248.040**
APRIL 12	**1,257.060**	**625.820**	**4.220**	**1,887.100**
MAY 12	**1,524.860**	**947.160**	**2.880**	**2,474.900**
JUNE 12	**1,327.720**	**729.680**	**3.840**	**2,061.240**
JULY 12	**1,379.560**	**784.420**	**2.900**	**2,166.880**
AUGUST 12	**1,445.240**	**761.980**	**3.660**	**2,210.880**
SEPTEMBER 12	**1,365.080**	**645.520**	**4.200**	**2,014.800**
OCTOBER 12	**1,515.520**	**803.620**	**2.160**	**2,321.300**
NOVEMBER 12	**1,603.020**	**849.460**	**11.340**	**2,463.820**
DECEMBER 12	**1,369.500**	**618.760**	-	**1,988.260**
TOTALS	**16,926.240**	**9,472.300**	**49.400**	**26,447.940**

Figure 4-2. Annual Refuse Total Comparison (2004-2012).

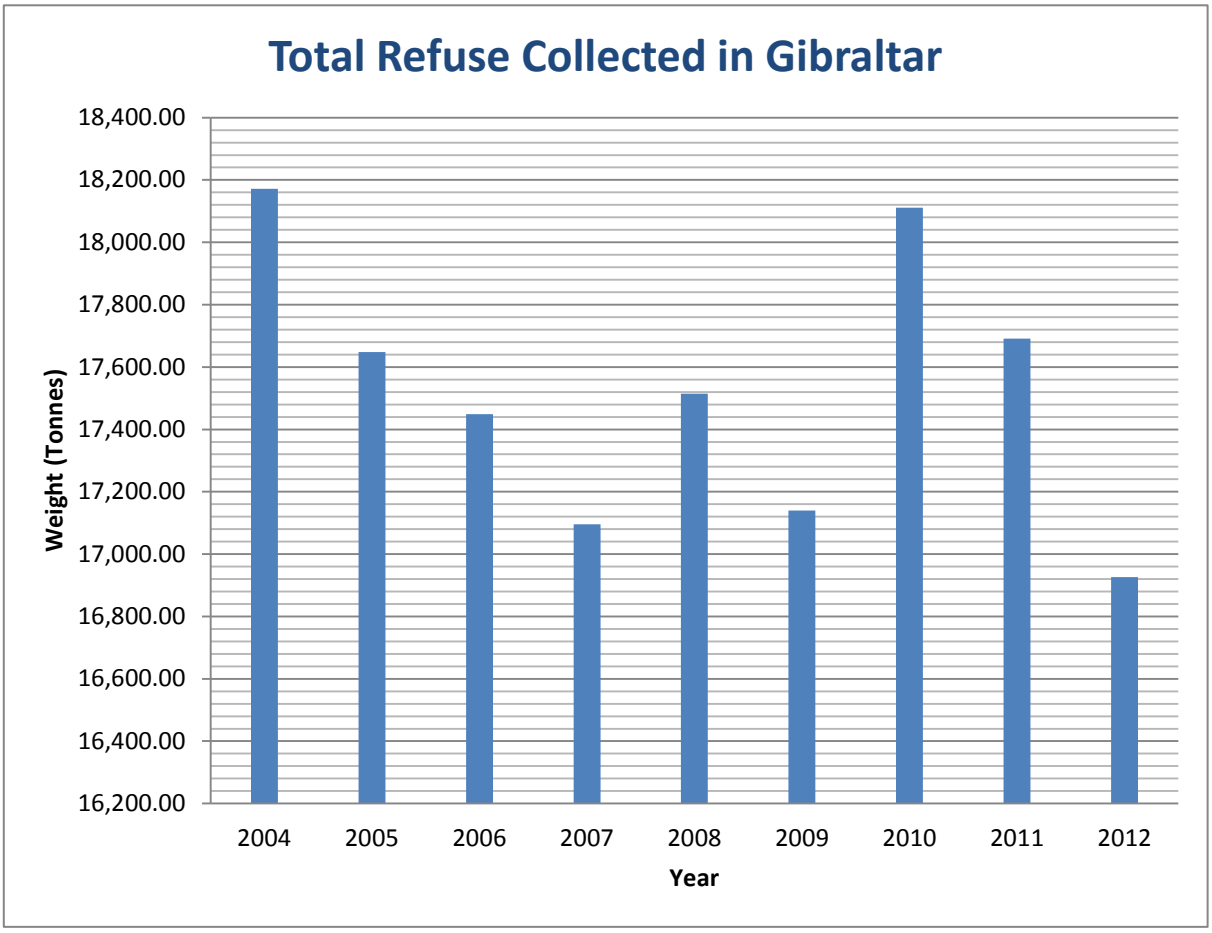


Figure 4-3. Annual Bulky Items Total Comparison (2006-2012).

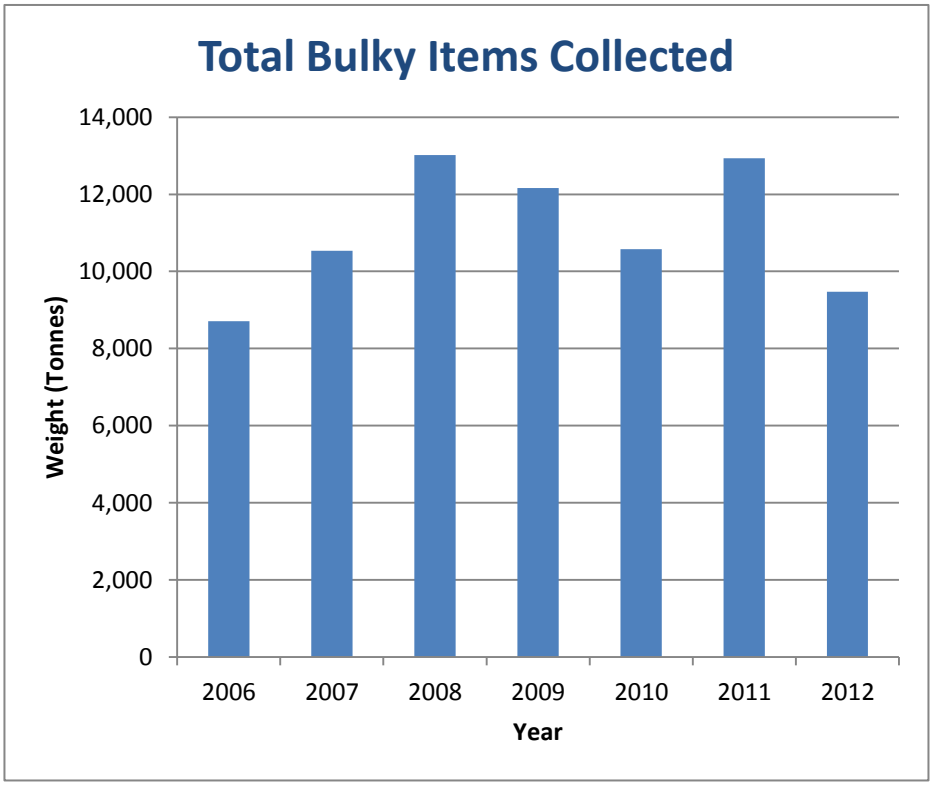


Figure 4-4. Annual Mattress Total Comparison (2006-2012).

One of the targets set in the EU 5th Environment Action Programme (EAP) was to reduce the generation of municipal waste, per capita, per year, to the average 1985 EU level of 300 kg by the year 2000, and then stabilise it at that level. Data received from EU countries shows that the target was far from ever being reached. The average amount of municipal waste generated per capita per year in many western European countries still exceeds 550kg. Furthermore, there are notable differences among countries both in the amount and the development of waste generation. The annual generation per capita varies from 306 kg in Czech Republic to 453 kg in Greece and up to 802 kg in Denmark.

4.4 Recycling

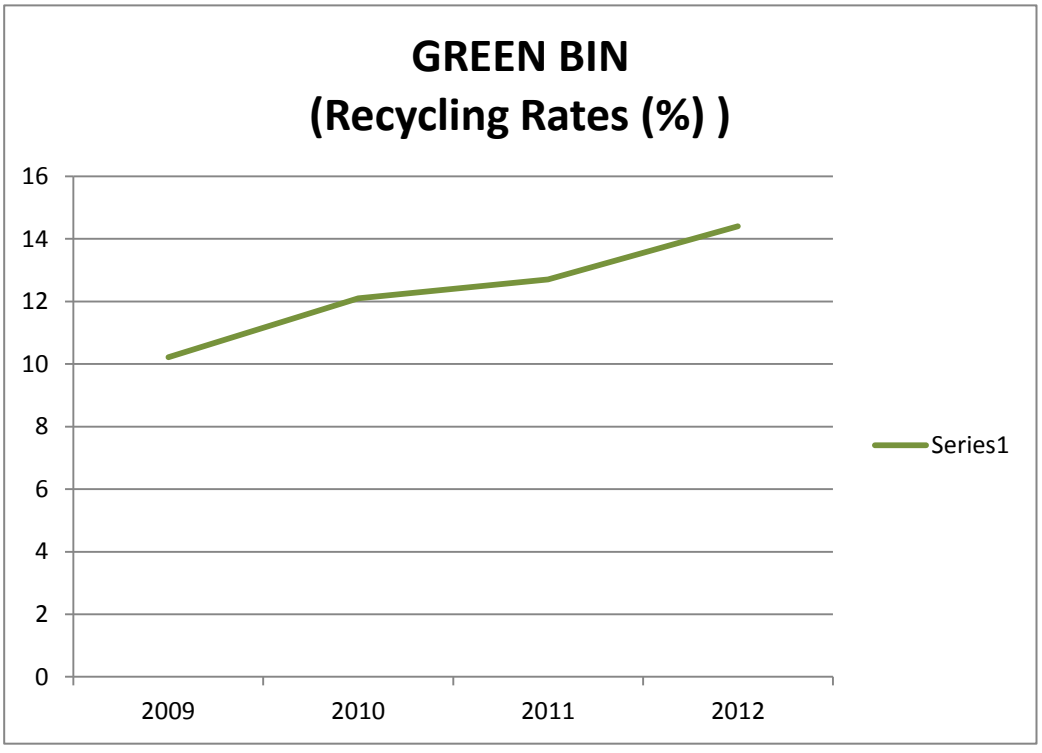
4.4.1 Glass and Cans

Recycling rates for glass have progressively increased per annum since the introduction of green recycling bins. Although this is a step in the right direction, the figures for recycled glass are still extremely low compared with the target figures of 50% by 2020 of Article 11 of the Waste Framework Directive (2008/98/EC).

Table 4-3. Green Bin Recycling Rates

GREEN BIN	2009	2010	2011	2012
Annual Recycling Rate (%)	10.22	12.1	12.7	14.41

Figure 4-5. Recycling rates (%) of glass from 2009-2012.



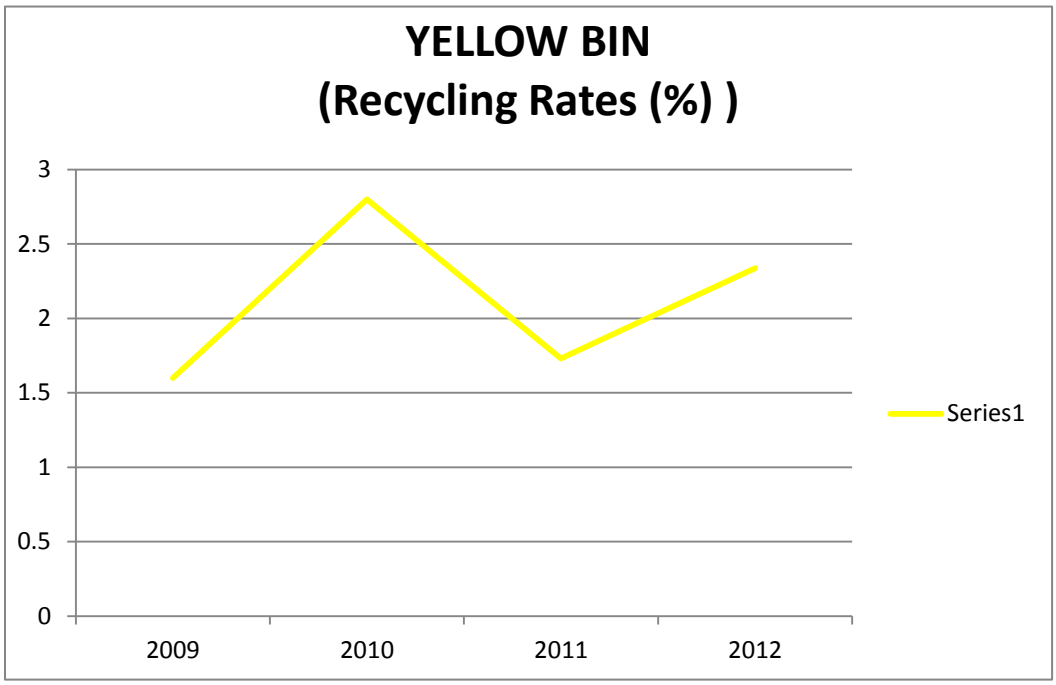
Recycling rates for cans saw a decrease in the amount of cans being recycled during 2011. Overall however, it can be noted from Table 4-4 that there is a slow increase in the number of cans being recycled. Although this is also a step in the right direction, the figures for

recycled cans are still extremely low compared with the target figures of 50% by 2020 of Article 11 of the Waste Framework Directive (2008/98/EC).

Table 4-4. Yellow Bin Recycling Rates

YELLOW BIN	2009	2010	2011	2012
Annual Recycling Rate (%)	1.6	2.8	1.73	2.34

Figure 4-6. Graph highlighting the recycling rates (%) of cans.



During December 2012, the Department of the Environment introduced further recycling bins to help further promote recycling as well as capture waste streams, including paper and plastics, not previously provided before.

Without a serious commitment from the local community, it will be difficult for Gibraltar to meet its targets. Separation of waste and subsequent recycling helps to save energy and natural resources as well as reduce our global carbon footprint.

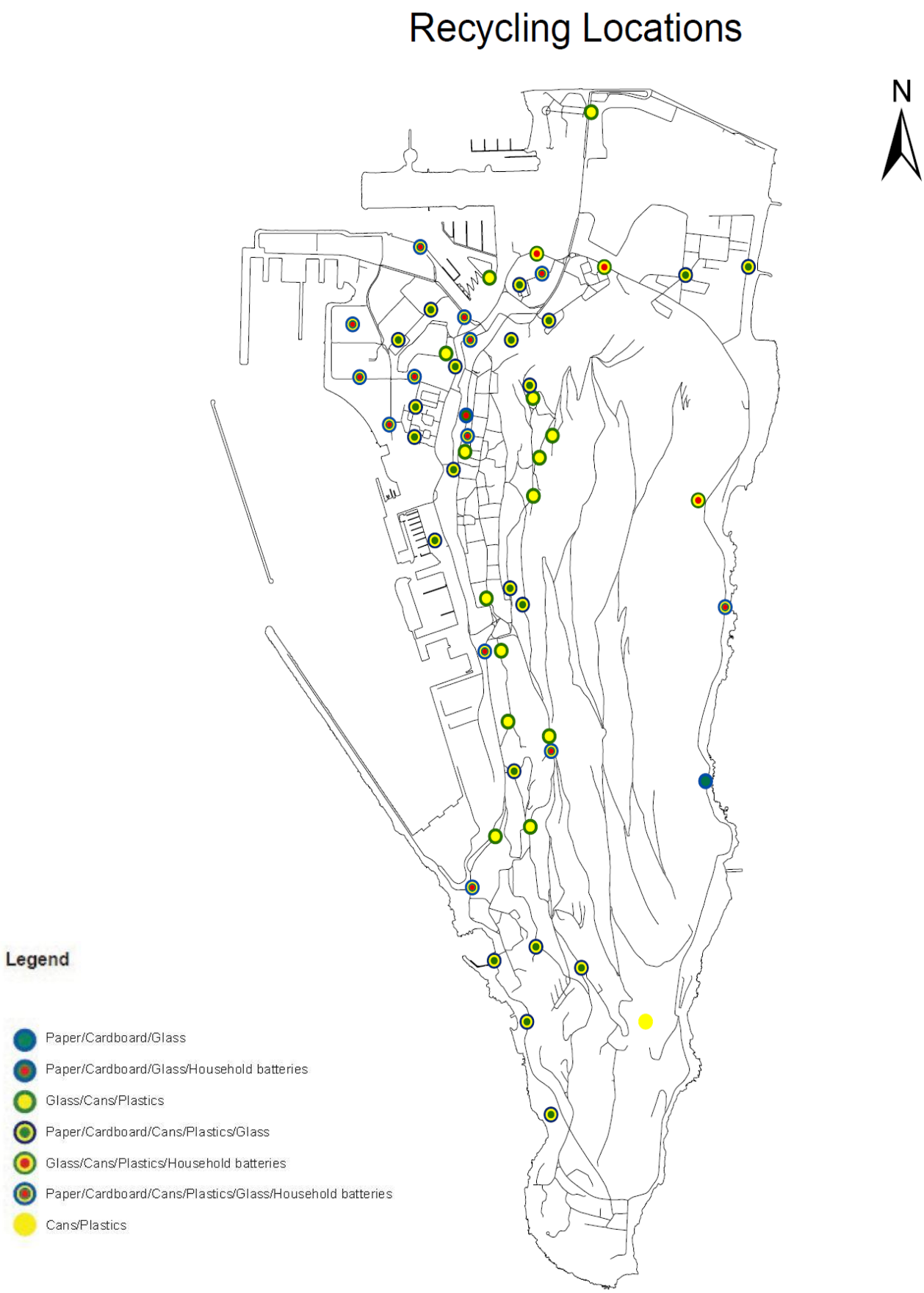
Table 4-5 details locations where the different recycling bins can be found, including those introduced towards the end of the year. Figure 4-7 highlights the location of all types of recycling bins introduced throughout Gibraltar.

Recycling Bin Locations

Table 4-5. Recycling points in Gibraltar.

North District	Red Sands Road - Grand Parade entrance
Gibraltar Airport Service Area	Rosia Road - footpath by Piccadilly Gardens
Glacis Estate - Archbishop Amigo House north	**West**
Glacis Estate - Constitution House north	Queensway - Commonwealth Car Park
Bayside Rd - teachers' car park entrance	Reclamation Road - Leisure Centre
Ocean Village	**North West**
Mons Calpe Road - Coach Park Entrance	Edinburgh Estate (north & south)
North East District	Queensway - Westside School entrance
Laguna Estate - by Ballymena House	Montagu Gardens
Laguna Estate/Devil's Tower Rd - by Ark Royal House	Varyl Begg Estate - St Paul's School entrance
Cemetery Road - by roundabout	Varyl Begg Estate - by Royal Sovereign House
East District	Harbour Views Estate
Eastern Beach Road - 2 locations	Europort Avenue - by entrance to rowing clubs
Sir Herbert Miles Road - bus stop by William's Way Refuse Cubicle	Fish Market Road - by refuse cubicle
Sir Herbert Miles Road - Black Strap Cove layby	Opposite St Bernard's Hospital entrance
South District	Harbour Views Road - by Bishop Fitzgerald School
Little Bay - promenade entrance	Devil's Tongue/Waterport Road junction footpath
Camp Bay promenade	**Within City Wall**
Rosia Road - by Rosia Battery	Grand Casemates - Service Area
Rosia Road - by bus stop New Mole House	Cloister Ramp
Cumberland Road - by refuse enclosure (North)	Baker’s Passage
Vineyards Estate	**Upper Town**
Naval Hospital Road within refuse enclosure south	Flat Bastion Road (south, by refuse cubicle)
Europa Road - by bus stop Garrison Gym	Willis’s Road (by New Police Block)
Europa Road - behind bus stop ex-Casino lift	Prince Edward’s Road (by refuse cubicle at Hargreaves)
Europa Road - lookout at top of path leading to Heathfield House, Witham's Road	Castle Road (by refuse cubicle below Sacred Heart Church)
South West District	Moorish Castle Estate (by main refuse cubicle)
Witham's Road - between Jumper's Building and St John's Court	Tarik Road Car Park (by refuse cubicle)
Red Sands Road - by Governor's Meadow House	Calpe Road (by Anderson House)

Figure 4-11. Recycling Option Locations



4.4.2 Waste Electrical and Electronic Equipment (WEEE)

The WEEE Directive was transposed into local law through the Environment (Waste) Regulations 2007 (WEEE Regulations). This legislation looks to minimise the environmental impacts of electrical and electronic equipment (EEE) when it reaches the end of its useful life. Systems need to be set up to facilitate and encourage the separate collection, subsequent treatment, re-use, recycling and ultimately environmentally sound disposal of WEEE.

These regulations have significant implications for importers, producers, retailers and end-users of EEE as well as those who treat or recover WEEE.

Importers of EEE need to declare how much EEE they are importing into Gibraltar. The relevant forms can be downloaded from the Department of the Environment website. Retailers and users of EEE need to ensure that items are disposed of correctly by being taken to the temporary WEEE park at the Europa Advance Road facility. Electrical and electronic equipment cannot be disposed of with household waste. The Environment (Waste) Regulations 2007 (WEEE Regulations) make provisions for retailers of EEE must offer a free take back in store to enable purchasers to return their WEEE when making a like for like purchase.

Detailed guidance on the WEEE regulations and their implications for you can be downloaded from the Department of the Environment website www.gibraltar.gov.gi/environment/environment.

All locally generated WEEE waste is processed for recycling at an authorised treatment facility in Spain.

A list of the quantities of WEEE imported, collected, and exported for treatment and recovery during 2012 can be found on the following page under Table 4-6.

Figure 4-6. WEEE generation in Gibraltar during 2012.

Year:	2012	Imported		Collected		Sent for treatment		Recovery
Categories		Quantity (No.)	Weight (tonnes)	Quantity (No.)	Weight (tonnes)	Quantity (No.)	Weight (tonnes)	%
Large Household appliances		3954.482	193.74961	2457	n/a	5062	158.325	48.54
Small Household appliances		3747	6.6082	179	n/a	209	1.25	85.65
IT and Telecoms Equipment		38868.62	504.75971	2168	n/a	1756	21.465	123.46
Consumer Equipment		18670	111.77364	491	n/a	466	10.76	105.36
Lighting equipment		30405	30405	200	n/a	14	0.03	1428.57
Electrical and electronic tools		23875	23.43343	20	n/a	75	0.93	26.67
Toys, Leisure & Sports Equipment		1189.012	53.62596	5	n/a	0	0	n/a
Medical devices		0	0	0	n/a	0	0	n/a
Monitoring & Control Instruments		3807	43.51041	2	n/a	0	0	n/a
Automatic dispensers		267	1.158	1	n/a	0	0	n/a

Recovery rates are calculated based on a formula which requires data on both the *collected* and *sent for treatment* aspects of the recycling process. For those columns which have a *n/a* insert, this refers to the fact that no exportation for treatment and recovery has taken place for these WEEE waste categories during 2012.

4.4.3 Batteries

Measures introduced to establish a scheme aiming at a high level of collection and recycling of batteries still continue. This scheme includes the collection of data regarding all local battery imports, collection of batteries for recycling, and exportation of said batteries for treatment and recovery. Details of data collected throughout 2012 have been provided in Figure 4-13 below. Please note that under the column 'Recovery', information is stated as

unavailable as a result of no batteries having been exported for treatment and recovery during 2012.

Because batteries are small in size, and there are currently no facilities in Gibraltar for the treatment and recovery of batteries, it is not economically viable to export small quantities to a treatment and recovery plant in Spain. Therefore, waste batteries and accumulators are stored in accordance with The Hazardous Waste Directive (91/689/EEC) and transported to Spain once sufficient quantities have been collected.

Figure 4-7. Battery generation in Gibraltar during 2012.

Year:	2012	Imported		Collected		Sent for treatment		Recovery
Categories		Quantity (No.)	Weight (tonnes)	Quantity (No.)	Weight (tonnes)	Quantity (No.)	Weight (tonnes)	%
Batteries		2322	27.4619	107	0.0845	0	0	n/a

The locations of all red battery recycling bins in Gibraltar during 2012 can be found in Figure 4-7.

4.4.4 Other waste materials

The recycling of other waste materials continues. Recyclable material from our municipal solid waste is manually and automatically separated and processed at the Complejo Medioambiental Sur De Europa in Los Barrios (non-recyclable waste then goes into landfill). In addition to this, wood and metal items are sorted at the previous incinerator site at Europa Advance Road. A separate Civic Amenities Site is operated by Gibraltar General Support Services Ltd, located at Europa Advance Road. At this site, the public can also dispose of their bulky timber items, paint, white goods and other electrical items, mattresses, building debris and metal scrap.

4.5 Clinical Waste

The clinical waste Incinerator is located at Governor's Cottage, Europa Advance Road and is run by Environmental Waste Management Services (EWMS) Ltd. The facility provides collection, transport and incineration services to all local clinical and medical waste producers (hospitals, laboratories, surgeries, medical, dental and veterinary clinics.

4.5.1 Collection of Clinical Waste

During 2012, 49,442 sixty litre containers of clinical waste were generated and collected locally. This equates to a total of 2,966,520 litres of clinical waste for 2012. Please refer to Figure 4-8 for a monthly breakdown of collected clinical waste during 2012.

Table 4-8. Clinical Waste collected during 2012

	Year	2012		
Month		No. of Cont	Ltrs per Cont	Total Ltrs
January		4422	60	265320
February		4284	60	257040
March		4286	60	257160
April		4098	60	245880
May		4249	60	254940
June		3898	60	233880
July		4045	60	242700
August		4106	60	246360
September		3706	60	222360
October		4162	60	249720
November		4135	60	248100
December		4051	60	243060
Annual Total		49442		2966520

4.5.2 Local Incineration of Clinical Waste

During 2012, 37,823 sixty litre containers of clinical waste were incinerated locally. This equates to a total of 2,269,380 litres of clinical waste for 2012. Please refer to Table 4-9 for a monthly breakdown of locally incinerated clinical waste during 2012.

Figure 4-9 Clinical Waste locally incinerated during 2012

	Year	2012		
Month		No. of Cont	Ltrs per Cont	Total Ltrs
January		3762	60	225720
February		3314	60	198840
March		3181	60	190860
April		3159	60	189540
May		3178	60	190680
June		3131	60	187860
July		3245	60	194700
August		2152	60	129120
September		3046	60	182760
October		3503	60	210180
November		3401	60	204060
December		2751	60	165060
Annual Total		37823		2269380

4.5.3 Exportation of Clinical Waste

Whilst Gibraltar has facilities for the incineration of locally generated clinical waste, on occasion, clinical waste is still exported for incineration. Reasons for this include:

- Preventative maintenance of the incinerator plant,
- Requirements for providing cremation services, and
- Local incineration plant breakdowns.

Clinical waste is a perishable, hazardous waste and therefore not suitable for accumulation and storage. When, due to any of the above mentioned reasons, there is a small accumulation of clinical waste which cannot be incinerated locally, EWMS Ltd arrange for its exportation.

During 2012, 11,124 sixty litre containers of clinical waste were exported for incineration to Spain. This equates to a total of 667,440 litres of clinical waste exported for 2012. Please refer to Table 4-10 for a monthly breakdown of exported clinical waste during 2012.

Figure 4-10 Clinical Waste exported for incineration during 2012.

	Year	2012		
Month		No. of Cont	Ltrs per Cont	Total Ltrs
January		648	60	38880
February		648	60	38880
March		1296	60	77760
April		648	60	38880
May		972	60	58320
June		864	60	51840
July		864	60	51840
August		2592	60	155520
September		432	60	25920
October		432	60	25920
November		432	60	25920
December		1296	60	77760
Annual Total		11124		667440

Chapter 5

Energy

Energy use is the main contributor towards the accelerated process of climate change. Gibraltar is working towards improving its energy efficiency and developing sources of renewable energy.

5. Energy

5.1 Background

Energy is a fundamental part of a person's everyday life and it sustains modern society. The current fossil-fuel based energy system is not sustainable as it contributes substantially to climate change and depends heavily on imports from very few countries.

Gibraltar is working towards ensuring its security and diversity of energy supply and working towards improving its energy efficiency. Gibraltar aims to expand on renewable energy and to encourage individuals and businesses to reduce the amount of energy they use within the home and work place, through the use of more efficient products and services as well as by implementing simple behavioural changes. Furthermore, the Government also aims to improve the energy efficiency of the transport and building sector.

5.2 Energy Performance of Buildings

The Energy Performance of Buildings Directive (EPBD) is an EU initiative aimed at reducing the amount of energy consumed by buildings in an attempt to reduce carbon emissions. It is a legal requirement to obtain an Energy Performance Certificate for buildings with fixed heating, cooling or mechanical ventilation, upon construction and prior to sale or rental. Failure to do so constitutes an offence and carries a fixed penalty fine.

The EPBD was transposed into local legislation via the Building (Energy Performance) Rules which came into force in 2009. In 2010, the EU amended and repealed the EPBD in order to make it more comprehensive and this has been transposed into the Environment (Energy Performance of Buildings) Regulations 2012. These Regulations seek to promote the improvement of the energy performance of buildings, taking into account outdoor climatic and local conditions, as well as indoor climate requirements and cost-effectiveness.

The revised regulations mean that new buildings, of any size, must be constructed to meet the minimum energy performance requirements. New buildings shall ensure that before the construction starts, the technical, environmental and economic feasibility of high-efficiency alternative systems such as decentralised energy supply systems based on energy from renewable sources; cogeneration; district or block heating or cooling and heat pumps, shall be considered.

Existing buildings undergoing major renovation, i.e. where the total cost of renovation is higher than 25% of the building's value or where the renovation covers more than 25% of the building area, the owner of the existing building shall ensure that the energy performance of the building or the renovated part, is upgraded in order to meet minimum energy performance requirements; in so far as this is technically, functionally and economically feasible.

Public authorities or institutions providing public services, with a total useful floor area of over 500m^2, will need to provide a Display Energy Certificate (DEC) and accompanying Advisory Report for the building. In July 2015 the threshold of 500m^2 shall be lowered to 250m^2.

In addition to this legislation, the Building Rules have been amended. These Rules now contain a section on conservation of fuel and power to reflect minimum energy performance standards.

Since its inception to date 543 properties have been certified.

5.3 Renewable Energy

The EU Directive on the Promotion of Use of Energy from Renewable Sources (2009/28/EC) establishes a common framework for the promotion of energy from renewable sources and sets mandatory targets for the overall share of the renewable energy sources in energy production and transport sectors. The effort to achieve the goal of 20% of energy from

renewables by 2020 is divided among Member States. The UK's established target is 15% by 2020. The Government of Gibraltar has therefore revised its previous target of 10% of renewable energy by 2012 to reflect these new commitments. Our renewable energy targets are now for an overall share of 15% of our energy from renewables by 2020.

This year solar powered street lighting was introduced in the area of the frontier loop and at the new Queensway car park.

5.4 Import Duty Measures

Import duty is no longer payable on renewable energy products. In 2012, duty on Biofuels was reduced to 0% and duty on Hybrid vehicles was reduced to 2% if imported by licensed dealers and halved (from private importer rates) if imported by private individuals. Recycled or approved environmentally friendly or ECO paper (paper from renewable forests) was reduced to 0%, as well as stationery made predominantly from recycled materials. Import duty on LED (light emitting diode) lamps and bulbs which use light emitting diodes instead of conventional filaments was also reduced to 0%.

Environmental Health

Chapter 6

Environmental health addresses all the physical, chemical, and biological factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. It is targeted towards preventing disease and creating health-supportive environments.

6.1 Environmental Health

The Environmental Agency (EA) has an essential role in maintaining and improving the well-being of the community. Many of the services it provides seek to secure healthier and safer places for people to live and work. The Agency is contracted by the Government of Gibraltar and is responsible for the enforcement of Environmental and Public Health legislation. It is headed by the Chief Environmental Health Officer who together with Environmental Health Officers, Assistant Environmental Health Officers, Pest Control Operatives and administrative staff ensure that the Agency's responsibilities are met.

The Environmental Agency dealt with 718 nuisance complaints and 176 pest complaints from the public in 2012. Table 5.1 summarises the nature of these complaints.

Table 5.1 – Summary of complaints received by the EA in 2012

Nature of Complaint	No of Complaints	Nature of Complaint	No of Complaints	Nature of Complaint	No of Complaints
Accumulations	104	Eaves gutters	5	Rodents	69
Air conditioning	2	Feral cats	16	Seagulls	4
Ants	11	Filthy premises	11	Sewage	66
Bees	3	Fitness	0	Smells	172
Bins	4	Fleas	12	Smoke/grit/dust	13
Chicken coops	4	Flies	4	Termites	7
Cockroaches	118	Fumes	12	Toilets	3
Dampness	37	Hoarding	0	Trees	10
Dangerous premises	19	Litter	9	Water	51
Defective premises	17	Mosquitoes	12	Other animals	10
Dog fouling	38	Pigeons	16	Other food	54
Drainage	67	Refuse cubicles	4	Other nuisance	54
Electric hazard	2			Other pests	12

Table 5.1 highlights the variety of complaints received (917 in total). One hundred and fifty nine abatement notices were served under the provisions of the Public Health Act 1950.

Efficient and effective compliance with legislation is enforced by the Environmental Agency responding with appropriate levels of action to individual cases. Thirty cases were referred for legal proceedings.

The Environmental Agency is responsible for numerous environmental health protection issues including:-

- The provision of housing reports for the Ministry for Housing and the inspection of housing in connection with disrepair in privately rented accommodation.
- The prevention and control of rats, mice and other pests of public health significance with the use of the latest environmentally friendly pesticides and techniques. If poison baits are used, tamper proof containers designed to prevent access of non-target species are used.
- The investigation and action on filthy and verminous premises.
- Control of pollution from both domestic and business premises, including smells.
- Investigation and action on drainage problems.
- The control and licensing of premises that are engaged in tattooing, skin-piercing or electrolysis.
- The control of feral pigeons.
- The licensing of pet shops.
- The inspection of hairdressers and nurseries.
- The investigation and tracing of contacts in connection with notifiable infectious diseases.
- The disinfection of premises after a notification of a notifiable infectious disease.
- The implementation of the Environment (Control of Dust) Regulations 2010. Twenty-four Certificates of Approval for Dust Control were issued in 2012. A total of 5 Abatement Notices regarding dust control were served.

6.2 Food Safety

6.2.1 What is food safety?

Food safety encompasses actions aimed at ensuring that all food you make, serve or sell is as safe as possible. Food safety policies and actions need to cover the entire food chain, from production to consumption (World Health Organization).

6.2.2 What is contamination of food and food poisoning?

Food Contamination is the term that describes food in which something harmful or objectionable is present. If you consume food contaminated with pathogenic (harmful) bacteria or viruses, there is a strong likelihood that you will suffer from food poisoning. Food may also be contaminated with physical objects that fall into the food or chemicals. Bacteria from the salmonella and campylobacter groups cause the most common type of food poisoning in Gibraltar.

As part of their everyday duties, Environmental Health Officers investigate food poisoning cases once they are reported to the Environmental Agency. The Environmental Health Officer conducts a thorough investigation to trace the source of infection. This normally entails visiting households, interviewing affected persons and offering precautionary advice to prevent the spread of further infection. Any food establishment associated with an outbreak is inspected immediately and a thorough investigation is carried out into the handling, storage, preparation and cooking of any suspect food to identify any malpractice, which may have led to contamination. Food samples and health screening of food handlers may be carried out if deemed necessary.

6.2.3 Inspection of Food Premises

The Environmental Agency has a Food Team comprising of Environmental Health Officers and Assistant Environmental Health Officers that carry out programmed food hygiene inspection of the 471 food premises in Gibraltar. These premises consist of restaurants, supermarkets, delicatessens, bakeries, groceries and confectionery outlets, as well as one

soda bottling plant. These Officers also advise the proprietors and employers of food premises on how to comply with the Food Hygiene Regulations 1977, and how to prevent food poisoning. The Environmental Agency works very closely with developers and proprietors at the design stage of new food premises offering advice in their design and layout so that they comply with the law.

During 2012, 1325 inspections of food premises were carried out.

6.2.4 Registration of Food Premises

The Food and Drugs Act 1964 requires certain premises in which high risk foods are handled for sale to be registered by Government. Registration is granted subject to the premises complying with the Food Hygiene Regulations.

These premises are inspected in accordance with a risk rating allocated to each. The inspection programme is focused on 'high risk' premises, for example, those that sell 'open food' (without wrapping). This is in line with the objective of risk-based, proportionate enforcement. The risk rating given (i.e. High, Medium or Low) requires officers to consider the following elements in each premises:

i. Potential Hazard:
    a. The type of food and method of handling.
    b. The processing of the food (if applicable).
    c. Consumer groups at risk.
ii. Compliance:
    a. With food hygiene and safety.
    b. Structural and equipment requirements.
iii. Confidence in management/control systems.
iv. Significance of risk of contamination of food.

During the inspection officers assess the structural condition of the premises, its cleanliness and will also question managers and staff about practices in food preparation. Observation within the business can identify poor food practices in relation

to storage and potential cross contamination. The inspection will take into account the previous history of the business, the documented food safety management system that should be on site and being completed regularly, as well as what is observed. Additionally food safety training of key staff will be encouraged.

As a high proportion of Gibraltar's food businesses are small to medium the Agency has concentrated on giving advice and helping these businesses to put in place relevant food safety management systems.

The Agency also encourages food businesses to join a voluntary food hygiene rating scheme known locally as 'Grading at a Glance'. The scheme is based on six tiers with a zero rating being the lowest score. A broadly compliant business would be at the third tier within the proposed scheme.

Ratings are published on Environmental Agency's website and signs must also be displayed prominently at the entrance to the building.

Few businesses have joined the scheme so far (7) as it is not compulsory and there is a perception that joining the scheme will involve unnecessary cost. This is not the case as any outgoing in terms of implementing a written management system or training of the staff will serve to improve the premises hygiene rating and therefore ultimately its reputation which should mean an increase in business and profits.

The scheme will help consumers to make informed choices about where to eat or buy food and they will be able to easily compare one business with another.

The Agency also responds to complaints about food premises or food composition or quality standards.

If there is an imminent risk to public health at a food premise, an opportunity for it to close voluntarily will be made to the proprietor, failing which legal action will be taken. The number of these premises is low and over the last 2 years four premises have

been temporarily closed. All of these premises are now broadly compliant. The Agencies consistent and proportionate approach to enforcement sends a clear message to businesses that poor hygiene standards will not be tolerated.

6.2.5 Sampling

Foods that are prone to give rise to bacterial food poisoning are those in which bacteria can multiply and live. These foods are those that have high protein contents such as cooked meals, meat and poultry products and meals prepared with meat and poultry. These foods, known as high-risk foods, are sampled frequently to ensure that they are free from food poisoning bacteria. Other foods are also sampled to ensure that they comply with compositional standards set down in food additives legislation.

A total of 250 samples were taken during 2012.

6.2.6 Alerts

The food team responds to food alerts from both the Food Standards Agency and the Rapid Alert System for Food and Feed of the European Community. These alerts advise Competent Authorities in different EU countries about problems associated with particular foods that have an impact on consumers. Depending on the nature of the alert, the food in question may be withdrawn from sale, surrendered to officers or in extreme cases seized under the provisions of the Food and Drugs Act.

6.2.7 Food Inspection

The vast majority of food consumed locally is imported from countries worldwide through the land frontier with Spain. The Environmental Agency operates an inspection post at the commercial border and all food imported is subject to inspections as necessary. A small amount of food is imported by shipping and this is also inspected by Environmental

Agency Health Officers. The inspection service is supplemented by a routine and random sampling programme of food products available at retail and catering outlets in Gibraltar.

6.2.8 Investigation of Food Complaints and Food Premises

The food team responds to complaints of insanitary premises, poor practices of food handlers and the general quality and fitness of food. When a complaint is received concerning a food business, a visit is made as soon as possible and an investigation is undertaken.

6.2.9 Investigation of food poisoning cases

Table 5.2 shows the incidence of key laboratory confirmed food borne infections over the past 6 years. It is these cases that the Environmental Health Officers are required to follow up. These figures are, however, only a partial representation, as not all persons who have a diarrhoeal illness go to their GP and of those who do, not all will submit a specimen. This said the incidence of all types of food poisoning is generally coming down.

Table 5.2 - Laboratory Confirmed Food borne infections (2007-2012).

Organism Isolated	2007	2008	2009	2010	2011	2012
Campylobacter Species	67	37	31	29	25	43
Salmonella species	14	26	18	12	11	10
Hepatitis A	4	2	4	3	0	0
Shigella species		1	2	0	0	2
Total	**85**	**66**	**55**	**44**	**36**	**55**

6.2.10 Food Safety Training

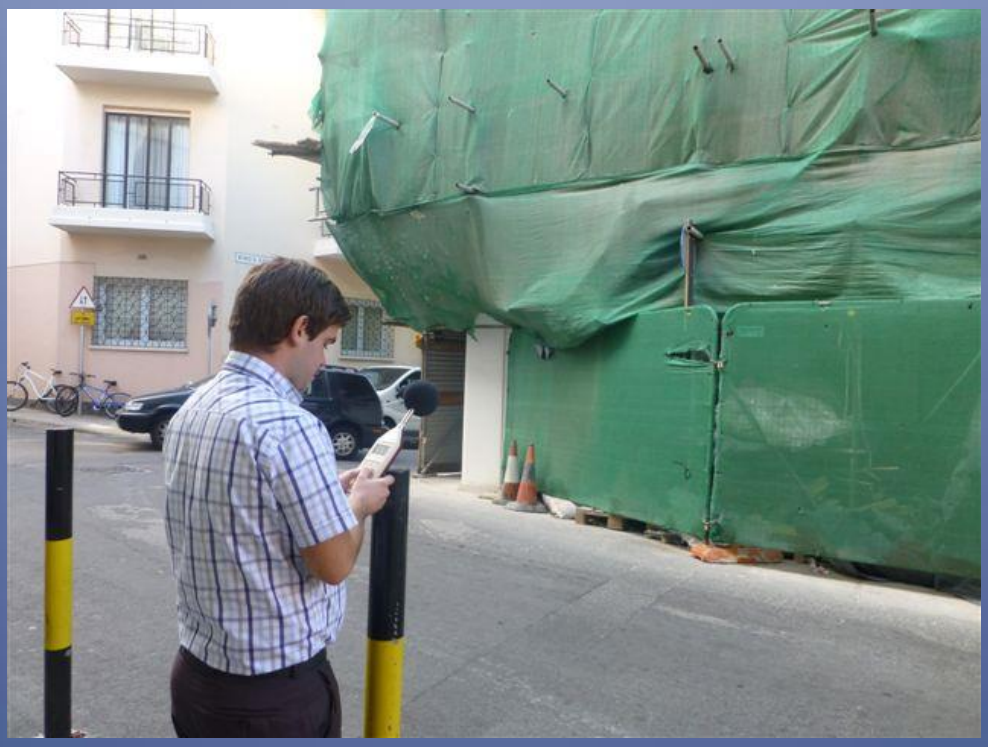
Environmental Health Officers of the Agency deliver Food Safety training for persons employed in the catering, food retail, healthcare and service industries.

Training courses are accredited by the Chartered Institute of Environmental Health (CIEH) and all our trainers are approved by the CIEH. Courses have been re-designed to be more relevant to specific business environments and are suitable for anyone working where food is prepared, handled or cooked.

The range of courses currently delivered is as follows:

- CIEH Level 1 Award in Food Safety Awareness in Catering & Retail
- CIEH Level 2 Award in Food Safety in Catering & Retail
- CIEH Level 3 Award in Supervising Food Safety in Catering
- CIEH Level 4 Management in Food Safety

During 2012, one course was held at level 1 with a total of 8 candidates, six courses were held at Level 2 with 52 candidates, one course at level 3 with 5 candidates and I course at Level 4 with 5 candidates.



Noise

Chapter 7

We breathe from the moment we are born until the moment we die. It is a vital and constant need, not only for us but for all life on Earth. Poor air quality affects us all: it harms our health and the health of the environment. Gibraltar's air quality measurements are underpinned by a rigorous quality assurance and control programme, central to which are crosschecked calibration standards that are traceable to and compared with internationally recognised metrology standards.

7. Noise

7.1 What is noise?

Noise can be defined as unwanted or harmful sound created by human activities and at times may affect our quality of life. Noise arising from vehicles, loud music, construction works etc. contributes to environmental noise.

7.2 Noise Complaints

Many of us may be affected at one time or another by neighbourhood noise. The noise could come from someone living near you playing loud music, construction activities in the street, or a business operating machinery.

7.2.1 How to complain about noise

- Approach whoever is responsible for the noise. You might find that the responsible party may not be aware that they are disturbing someone. The majority of noise complaints are solved amicably and informally.
- If the above does not resolve the issue, contact the Environmental Agency or the RGP both of which have powers to act against different sources of noise.

The Royal Gibraltar Police deals with noise arising from motor cycle, loud music from cars and licensed premises.

The Environmental Agency deals with noise problems arising from construction sites, air conditioning plant, generators etc. The Agency will also investigate problems with loud music coming from dwellings. It can also take action against the operators of licensed premises for causing a noise nuisance at any time of the day or night whilst Royal Gibraltar Police will invariably take action if the noise nuisance occurs after the licensed hours.

7.2.2 What actions can be taken

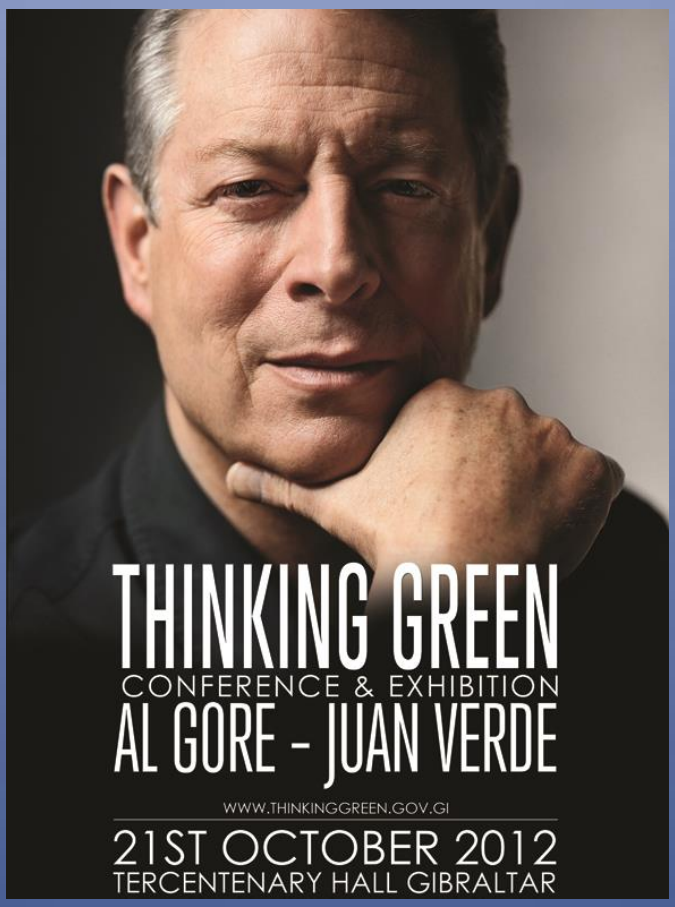
The two authorities have powers to deal with noise under their jurisdiction in different ways for example, the Royal Gibraltar Police have powers to report offenders and the Environmental Agency has powers to serve notices requiring any noise considered a nuisance, to be abated.

Table 7.1 Noise Complaints received by the Environmental Agency in 2012.

Nature of Complaint:	Number of Reports:
Noisy Establishments	7
Industrial Noise	23
Shipping Noise	2
Construction Noise	15
Noisy Neighbours	8
Dogs	3
Miscellaneous	17
Alarms	1
Total:	**76**

The Environmental Agency received a total of 76 noise complaints in 2012, a total of 2 Abatement Notices were served to deal with noise nuisances and on one occasion the institution of legal proceedings was necessary to abate the nuisance.

The total number of noise complaints received by the Royal Gibraltar Police in 2012 was 689. From this total, general noise complaints amounted to 555 whilst 132 were in relation to loud music from licensed premises.



Chapter 8

Public Awareness

Public awareness refers to the important role that community enthusiasm and knowledge has in building sustainable societies. Delivering knowledge to remote communities requires strategies for effective communication.

8.1 Environmental Education

Environmental education explains how natural environments function and, in particular, how human beings can seek to manage their behaviour and ecosystems in order to live sustainably. It refers not only to education within the school system but to all efforts to educate the public including print materials, websites and media campaigns.

Environmental education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges and fosters attitudes, motivations and commitments to make informed decisions and take responsible action (UNESCO, Tbilisi Declaration, 1978).

It focuses on:

- Awareness and sensitivity to the environment and its challenges;
- Knowledge and understanding of the environment and environmental problems;
- Attitudes of concern for the environment and motivation to maintain or improve; environmental quality;
- Skills to identify and help resolve environmental concerns;
- Participation in activities that lead to the resolution of environmental challenges.

Every year the Department of the Environment visits Gibraltar's schools and addresses each school year with specific environmental awareness presentations. The yearly theme is determined by the United Nations Environmental Programme. During 2012 the theme for World Environment Day celebrations was "The Green Economy".

8.2 World Environment Day

World Environment Day (WED) is an annual event which aims to be the biggest and most widely celebrated global day for positive environmental action. WED activities take place all year round but culminate on 5th June every year, involving people from all over the world. WED celebrations began in 1972 and have grown to become one of the main vehicles through which the UN stimulates worldwide awareness of the environment and encourages political attention and action. This is the 7th year that Gibraltar has participated.

Through WED, the UN Environment Programme is able to personalise environmental issues and enable everyone to realise not only their responsibility, but also their power to become agents for change in support of sustainable and equitable development. WED is also a day for people from all walks of life to come together to ensure a cleaner, greener and brighter outlook for themselves and future generations.

The theme for World Environment Day 2102 celebrations was The Green Economy. The theme invited people to examine their activities and lifestyle and see how the concept of a "Green Economy" could fit in to them.

The UN Environment Programme defines the Green Economy as one that results in improved human well-being and social equity, while significantly reducing environmental

risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive.

Practically speaking, a Green Economy is one whose growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. These investments need to be catalysed and supported by targeted public expenditure, policy reforms and regulation changes.

Local celebrations included the now traditional school presentations as well as a talk by Minister for Health and the Environment, Dr John Cortes. All schools were presented with commemorative participation trophies.

8.3 Thinking Green Conference & Exhibition

The Thinking Green Conference held in Gibraltar on the 21st October has been heralded as a resounding success. The event began at 10 am on Sunday with a trade fair in which local businesses and NGOs were able to display carbon-friendly technologies and raise general awareness of local environmental issues of concern. Attracting a steady stream of visitors throughout the day, both traders and visitors alike expressed their satisfaction with the quality of products and information on offer.

The trade fair was followed by the main event, the Thinking Green Conference. Attended by approximately 1000 people, including students from both comprehensives, the conference was opened by Dr John Cortes, who, having previously stated that the conference put a stamp on the Gibraltar Government's commitment to the environment, proceeded to outline an 11 point plan which would turn that commitment into concrete action.

He was followed by Juan Verde, advisor to Barack Obama and international co-director of his re-election campaign, who conveyed 3 principle messages in his speech. The first was that, despite the efforts of some individuals to discredit climate science, the debate on

climate change is effectively over. Climate change is a real and pressing phenomenon whose impacts will be irreversible. The second was that we need to change the way we think about energy generation and pollution in order to adapt to living in a carbon constrained world and the third was that this change would result in an unprecedented growth in green technology and other sustainable innovations which would lead to historic business and investment opportunities for those willing to seize the moment.

After a short coffee break, Former US Vice President and Nobel Peace Prize Winner, Al Gore took to the stage. He first congratulated the Gibraltar Government for their strong stance on environmental matters and personally thanked Dr. John Cortes for his efforts. During a 50 minute presentation VP Gore explained the climate crisis, outlining the historical background and drawing on examples from around the world to demonstrate the impacts that are already being felt. Using a series of powerful images he described the unprecedentedly high temperatures recorded in 10% of the world's cities, the extreme storms and droughts, the fires and dust storms and the sea level rise which has resulted in the displacement of millions of people around the world.

He ended on a positive note, however, stating that investment in green technologies had surpassed expectations and that attitudes across the globe were changing. He described

Gibraltar as an example for the rest of the world and those attending were left in no doubt that Gibraltar can and will step up to the challenge of climate change over the coming years.