

2021 STATISTICS REPORT

THINKING GREEN DIGEST



Department of the Environment,
Sustainability, Climate Change
and Heritage

HM Government of Gibraltar

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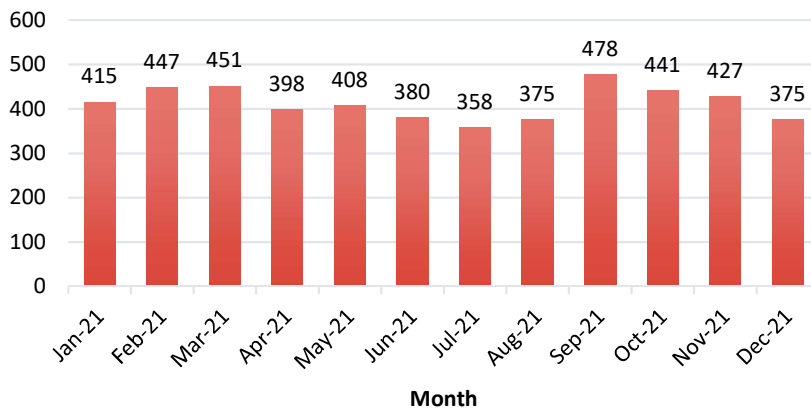
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Air Quality

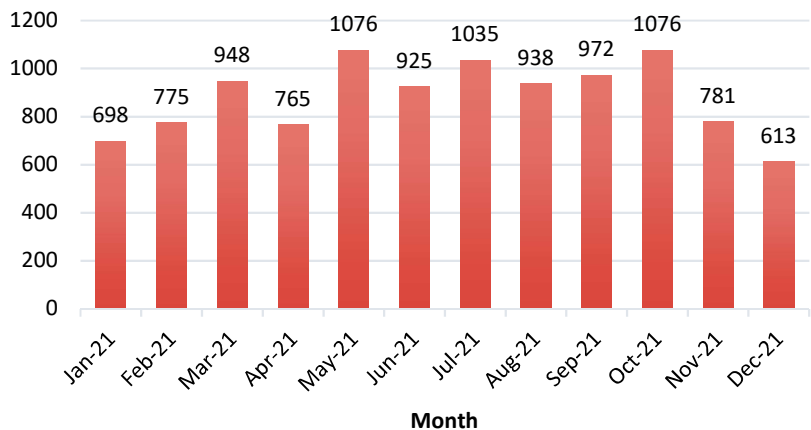
In Gibraltar, a formalised air quality monitoring programme is in operation utilising a variety of methodologies, and taking place at selected locations. Developed in accordance with European Union (EU) directive requirements, air quality in Gibraltar since 2008 has been monitored using passive sampling, active (semi-automatic) sampling, and automatic point monitoring. Deployed at sites throughout Gibraltar, these monitors work to provide a comprehensive understanding of variations in air quality according to location (urban/suburban), time, and season.

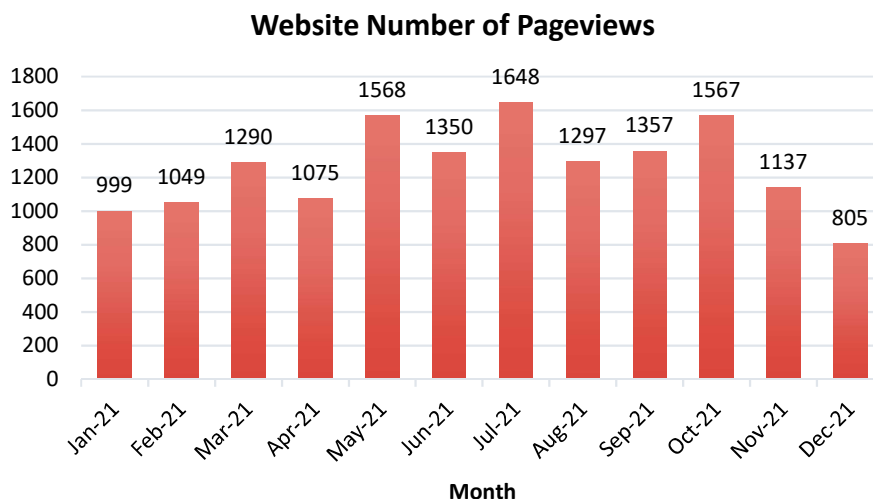
With some results available in real time, these as well as historical records can be accessed by the public at www.gibraltarairquality.gi. The table below provides a record of activity on Gibraltar's air quality website in 2021.

Website Number of Visits



Website Number of Unique Visitors





Annual Automatic Data Summary Reports

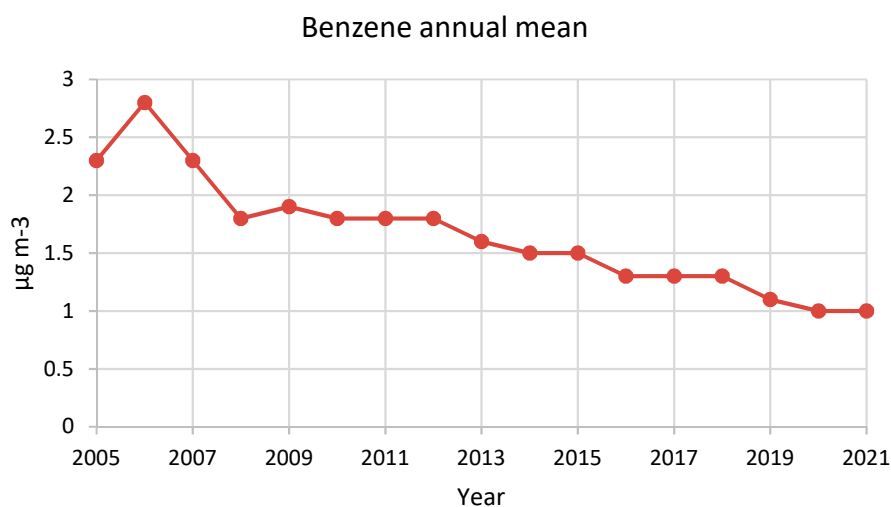
Rosia Road: 1st January to 31st December 2021

At Rosia Road, concentrations for pollutants such as benzene, carbon monoxide (CO), nitrogen dioxide (NO₂), and sulphur dioxide (SO₂) are logged. Records for 2021 are as follows:

Benzene

POLLUTANT	BENZ
Maximum hourly mean	14 $\mu\text{g m}^{-3}$
Maximum running 8-hour mean	8.8 $\mu\text{g m}^{-3}$
Maximum running 24-hour mean	6.5 $\mu\text{g m}^{-3}$
Maximum daily mean	4.6 $\mu\text{g m}^{-3}$
Data capture	86 %

Rosia Road benzene results 2021.

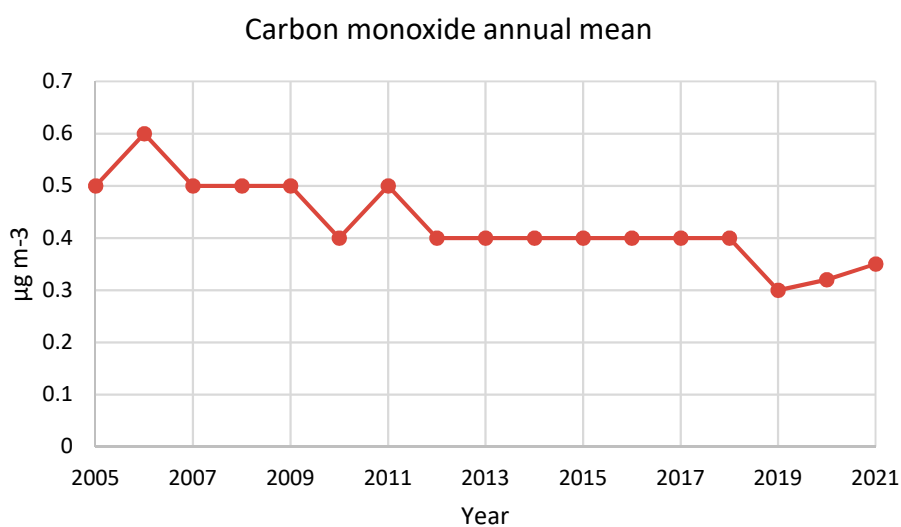


Rosia Road benzene annual mean.

Carbon Monoxide

POLLUTANT	CO
Maximum hourly mean	2.3 $\mu\text{g m}^{-3}$
Maximum running 8-hour mean	1.1 $\mu\text{g m}^{-3}$
Maximum running 24-hour mean	0.67 $\mu\text{g m}^{-3}$
Maximum daily mean	0.66 $\mu\text{g m}^{-3}$
Data capture	42 %

Rosia Road carbon monoxide monitored results 2021.



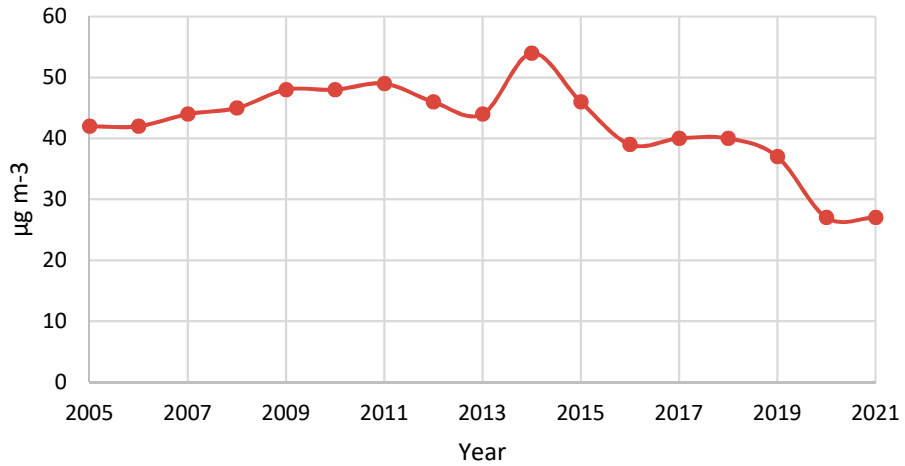
Rosia Road carbon monoxide annual mean.

Nitrogen Dioxide

POLLUTANT	NO ₂
Maximum hourly mean	617 $\mu\text{g m}^{-3}$
Maximum running 8-hour mean	190 $\mu\text{g m}^{-3}$
Maximum running 24-hour mean	86 $\mu\text{g m}^{-3}$
Maximum daily mean	78 $\mu\text{g m}^{-3}$
Data capture	97 %

Rosia Road nitrogen dioxide monitored results 2021.

Nitrogen dioxide annual mean



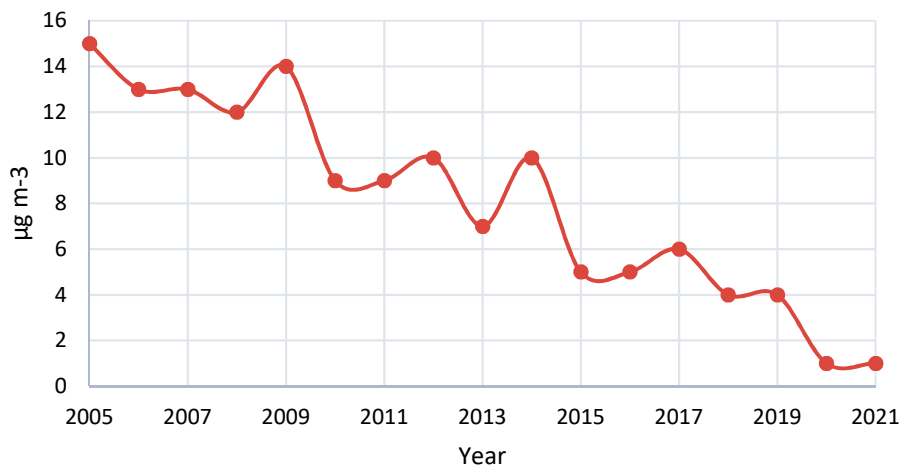
Rosia Road nitrogen dioxide annual mean.

Sulphur Dioxide

POLLUTANT	SO ₂
Maximum hourly mean	32 µg m ⁻³
Maximum running 8-hour mean	9 µg m ⁻³
Maximum running 24-hour mean	4 µg m ⁻³
Maximum daily mean	4 µg m ⁻³
Data capture	24 %

Rosia Road sulphur dioxide monitored results 2021.

Sulphur dioxide annual mean



Rosia Road sulphur dioxide annual mean.

Exceedences

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

Rosia Road pollutant exceedences for 2021.

Three threshold exceedences were detected for nitrogen dioxide at Rosia Road in 2021.

South District Power Stations

The table below highlights the engine operating hours of South District power stations in 2021.

Engine Hours	
	Total 2021
GMES South Temp. Gen. (Sets 21-30)	1,076 hours

South District Power Stations engine hours in 2021.

Bleak House: 1st January to 31st December 2021

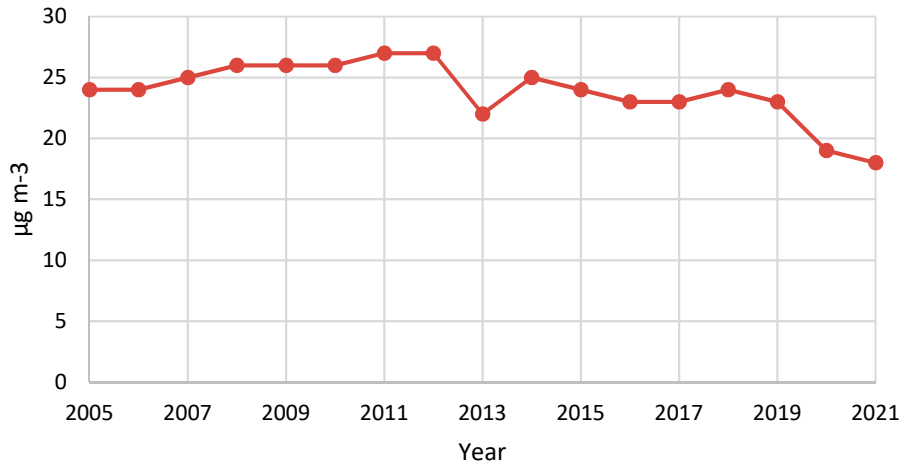
At Bleak House, nitrogen dioxide and ozone (O₃) concentrations are monitored. Results for the suburban area in 2021 are as follows:

Nitrogen Dioxide

POLLUTANT	NO₂
Maximum hourly mean	129 µg m ⁻³
Maximum running 8-hour mean	79 µg m ⁻³
Maximum running 24-hour mean	60 µg m ⁻³
Maximum daily mean	60 µg m ⁻³
Data capture	88 %

Bleak House nitrogen dioxide monitored results 2021.

Nitrogen dioxide annual mean



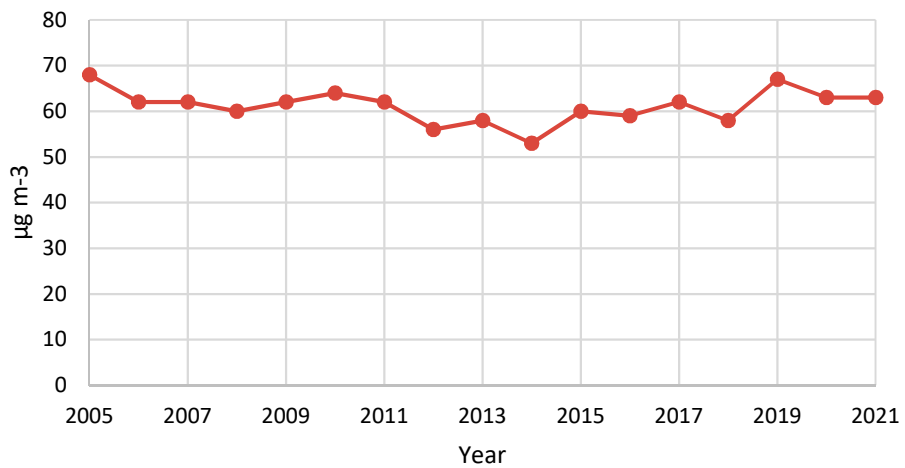
Bleak House nitrogen dioxide annual mean.

Ozone

POLLUTANT	O ₃
Maximum hourly mean	133 µg m ⁻³
Maximum running 8-hour mean	123 µg m ⁻³
Maximum running 24-hour mean	111 µg m ⁻³
Maximum daily mean	108 µg m ⁻³
Data capture	93 %

Bleak House ozone monitored results 2021.

Ozone annual mean



Bleak House ozone annual mean.

Exceedances

Pollutant	Public Health (Air Quality Limit Values) Rules 2002, (Amendment) Rules 2003 and (Ozone) Rules 2004	Exceedances
Nitrogen Dioxide	Hourly mean > 200 $\mu\text{g m}^{-3}$	0
Ozone	Running 8-hour mean > 120 $\mu\text{g m}^{-3}$	1

Bleak House pollutant exceedances for 2021.

Data collected show that there was one recorded exceedance of Ozone at Bleak House in 2021. Ozone is formed by the sunlight-initiated oxidation of volatile organic compounds (VOCs) in the presence of nitrogen oxides (NO_x). Not produced locally, this pollutant is created from ozone precursors that are predominantly of a transboundary nature.

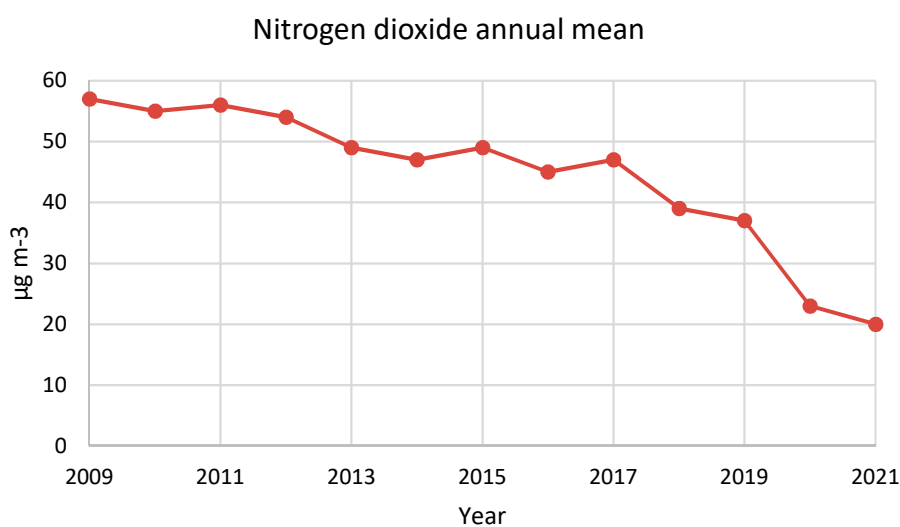
Witham's Road: 1st January to 31st December 2021

As the third automatic monitoring station, Witham's Road is located in the South District and within range of the South District power stations. Positioned here intentionally to observe the effects of traffic and power station emissions on pollutant levels, nitrogen dioxide is recorded at this site and has been monitored since 2008.

Nitrogen Dioxide

POLLUTANT	NO_2
Maximum hourly mean	96 $\mu\text{g m}^{-3}$
Maximum running 8-hour mean	71 $\mu\text{g m}^{-3}$
Maximum running 24-hour mean	56 $\mu\text{g m}^{-3}$
Maximum daily mean	53 $\mu\text{g m}^{-3}$
Data capture	60 %

Witham's Road nitrogen dioxide monitored results 2021.



Witham's Road nitrogen dioxide annual mean.

Exceedances

Pollutant	Public Health (Air Quality Limit Values) Rules 2002, (Amendment) Rules 2003 and (Ozone) Rules 2004	Exceedances
Nitrogen Dioxide	Hourly mean > 200 $\mu\text{g m}^{-3}$	0

Witham's road pollutant exceedances for 2021.

In 2021, no threshold exceedances were recorded at Witham's road.

Overview of Gibraltar's automatic air pollution measurement

To ensure the accuracy and reliability of all results documented by Gibraltar's air quality monitoring programme, substantial data capture is necessary. The table below provides an indication on Gibraltar's percentage of data capture, compared to that of the UK.

2021	CO	NO2	O3	PM10	PM2.5	SO2
Number of Stations	7	161	76	93	82	28
Number of stations < 85%	5	20	6	11	11	11
Number of stations < 90%	5	29	8	15	18	16
Average data capture (%) (UK)	75.26	91.89	93.49	93.66	92.43	84.11
Average data capture (%) (Gib)	42	81.7	93	25	0	24

Data capture 2021.

Unfortunately, in 2021 data quality and quantity issues were experienced throughout the network as much of the monitoring kit in place had exceeded its expected operational lifespan and was in need of repair or replacements. This resulted in low data capture for many pollutants and a complete absence of data for some. Ongoing configuration of the network including the installation of new equipment and associated network enhancements will be undertaken in 2022.

Compliance with Air Quality Limit Values

To ensure compliance with air quality limit values, it is necessary to compare gathered data with relevant policy thresholds. Within this section, pollutants from the automatic monitoring framework (carbon monoxide, nitrogen dioxide, sulphur dioxide and ozone) are evaluated, with failures to meet standards highlighted in red, and compliant values highlighted in green.

Air quality objective for CO (as maximum daily running 8hr mean)	Recorded levels (as maximum daily running 8hr mean)
10 mg m^{-3}	1.1 mg m^{-3}

Automatic measurement for CO in 2021.

Air Quality Objective for NO ₂	Recorded Annual Mean
40 $\mu\text{g m}^{-3}$	27 $\mu\text{g m}^{-3}$ (Rosia Road)

20 $\mu\text{g m}^{-3}$ (Witham's Road)

18 $\mu\text{g m}^{-3}$ (Bleak House)

Recorded annual mean for NO_2 in 2021.

Air Quality Objective for NO_2 (1 hour mean)	Recorded exceedances
200 $\mu\text{g m}^{-3}$ not to be exceeded more than 18 times per year	3 (Rosia Road)
	0 (Witham's Road)
	0 (Bleak House)

Exceedances recorded for one-hour mean for Nitrogen Dioxide in 2021.

Air Quality Objective for SO_2 (Daily Mean)	Recorded exceedances
125 $\mu\text{g m}^{-3}$ not to be exceeded more than 3 times per year	0
350 $\mu\text{g m}^{-3}$ not to be exceeded more than 24 times per year	0

Recorded daily and hourly exceedances for Sulphur dioxide in 2021.

Air Quality Objective for Benzene (Annual Mean)	Recorded Annual Mean
5 $\mu\text{g m}^{-3}$	1 $\mu\text{g m}^{-3}$

Recorded annual mean for Benzene in 2021.

Air Quality Objective for Ozone (Maximum Daily 8 Hour Mean)	Maximum rolling 8-hr mean ($\mu\text{g m}^{-3}$)
120 $\mu\text{g m}^{-3}$ not to be exceeded more than 25 days per calendar year, averaged over 3 years.	123 $\mu\text{g m}^{-3}$ Target exceeded 1 time in 2021

Maximum rolling 8-hour mean for Ozone in 2021.

Review of Gibraltar's non-automatic air pollution measurements

As part of Gibraltar's non-automatic monitoring programme, concentrations of particulates and heavy metals such as arsenic (As), cadmium (Cd), nickel (Ni), and lead (Pb) are measured. Assessed against limit values and objectives, the following series of data highlights compliant figures in green and non-compliant in red.

Lead

Air Quality Objective for Lead (measured as an annual mean)	Recorded Annual Mean
0.5 $\mu\text{g m}^{-3}$	0.006 $\mu\text{g m}^{-3}$ (Rosia Road)
	0.0043 $\mu\text{g m}^{-3}$ (Bleak House)

Recorded annual mean for Lead in 2021.

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

Pollutant	Parameter	Target Value	Recorded Average
Arsenic	Annual average	6 ng m^{-3}	1.3 ng m^{-3} (Rosia Road)
			1.2 ng m^{-3} (Bleak House)
Cadmium	Annual average	5 ng m^{-3}	1.6 ng m^{-3} (Rosia Road)
			1.5 ng m^{-3} (Bleak House)
Nickel	Annual average	20 ng m^{-3}	12 ng m^{-3} (Rosia Road)
			9.2 ng m^{-3} (Bleak House)
BAP	Annual average	1 ng m^{-3}	0.002 ng m^{-3} (Rosia Road)

4th Daughter Directive pollutant recordings for 2021.

Diffusion Tube Networks

Integral to the non-automatic monitoring programme, a diffusion tube based method is used to assess monthly average concentrations of nitrogen dioxide and benzene at a number of sites across Gibraltar. Diffusion tube results are indicative only and not as reliable as the automatic monitoring network.

Summary of Hydrocarbons

Below, average hydrocarbon concentrations for benzene are shown. With a pollutant threshold of 5 $\mu\text{g m}^{-3}$, the table highlights where compliance has been achieved, and also provides a comparison to the previous year's results to determine whether there are improvements being made.

Site ID	Site Name	2020 Benzene ($\mu\text{g m}^{-3}$)	2021 Benzene ($\mu\text{g m}^{-3}$)	Difference
gib1	Rosia Road	0.8	1.0	0.2
gib15	Catalan Bay Road	0.4	0.6	0.2
gib16	Laguna Estate	0.5	0.7	0.2
gib17	Kings Lines Fuel Depot	0.7	0.6	-0.1
gib18	Moorish Castle Estate	0.6	0.6	0
gib19	North Mole	0.8	0.8	0

gib2	Bleak House	0.5	0.6	0.1
gib20	Sundial Roundabout	0.9	1.0	0.1
gib21	Anchorage Rosia Road	0.6	0.7	0.1
gib3	Jumpers	0.8	0.9	0.1
gib30	Governors Meadow House	0.6	0.6	0
gib4	Devils Tower Road	0.5	0.8	0.3
gib5	Glacis Road	1.0	1.2	0.2
gib6	Queensway	0.8	0.9	0.1
gib7	Harbour Views	0.6	0.6	0

Average hydrocarbon concentrations for Benzene 2021.

Compliance across all sites was achieved with readings measuring well below the 5 $\mu\text{g m}^{-3}$ threshold.

Nitrogen Dioxide Network

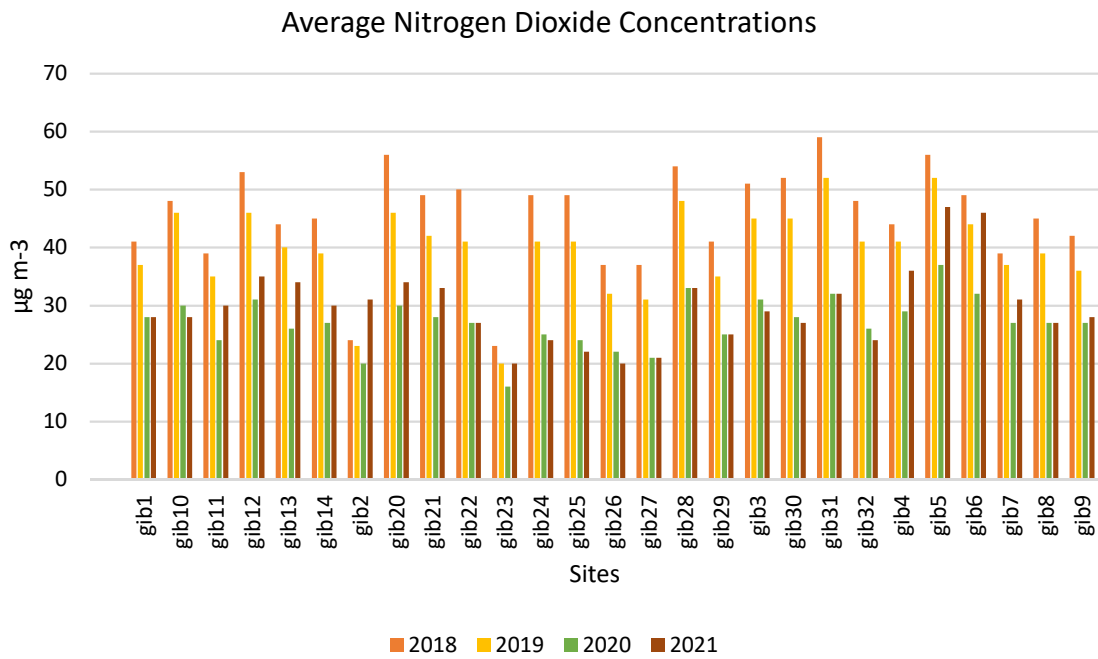
The following table shows diffusion tube readings of nitrogen dioxide at a variety of locations throughout Gibraltar. The target limit for this pollutant is 40 $\mu\text{g m}^{-3}$.

Site ID	Site Name	2020 NO ₂ ($\mu\text{g m}^{-3}$)	2021 NO ₂ ($\mu\text{g m}^{-3}$)	Difference
gib1	Rosia Road	28	28	0
gib10	South Barracks Road	30	28	-2
gib11	Main Street	24	30	6
gib12	Water Gardens	31	35	4
gib13	George Don House	26	34	8
gib14	Prince Edwards Road	27	30	3
gib2	Bleak House	20	31	11
gib20	Sundial Roundabout	30	34	4
gib21	Anchorage Rosia Road	28	33	5
gib22	Rosia Promenade	27	27	0
gib23	Lathbury Industrial Park	16	20	4
gib24	Upper Withams Entrance	25	24	-1
gib25	Churchill House	24	22	-2
gib26	Alameda Gardens Theatre	22	20	-2
gib27	Alameda Gardens Access Road	21	21	0
gib28	Rock Hotel	33	33	0
gib29	Gardiners Road	25	25	0
gib3	Jumpers	31	29	-2
gib30	Governors Meadow House	28	27	-1
gib31	Dockyard Road	32	32	0
gib32	Woodford Cottage	26	24	-2
gib4	Devils Tower Road	29	36	7
gib5	Glacis Road	37	47	10
gib6	Queensway	32	46	14
gib7	Harbour Views	27	31	4

gib8	Red Sands Road	27	27	0
gib9	Lime Kiln Road	27	28	1

Average nitrogen dioxide concentrations in 2021.

In 2021, compliance with the pollutant target limit was achieved at all sites except two. Two sites that were non-compliant were Glacis Road and Queensway, recording 47 $\mu\text{g m}^{-3}$ and 46 $\mu\text{g m}^{-3}$, respectively.



Average nitrogen dioxide concentrations 2018-2021.

Natural Resources

Bathing Water

The Bathing Water Directive (2006/7/EC), adopted on 15th February 2006, was transposed into Gibraltar law by the Environment (Quality of Bathing Water) Regulations 2009. In accordance with the requirements of this legislation, regular monitoring is carried out at Gibraltar's six bathing areas - Camp Bay, Catalan Bay, Eastern Beach, Little Bay, Sandy Bay Western Beach – and more. The number of samples taken at respective sites in 2021 is as follows:

Site Name	Number of samples taken
Camp Bay	19
Little Bay	19
Catalan Bay	20
Sandy Bay	19
Sandy Bay Outer Groyne	10
Eastern Beach	19
Eastern Beach Frontier Fence	19
Western Beach	19
GASA pier	6
Rosia Bay Beach	3
Rosia Bay Pier	10

Number of samples taken as part of Environment (Quality of Bathing Water) Regulations 2009 monitoring.

Further to these legislative requirements, there is also a need to monitor for two microbiological indicators of faecal contamination: *E.coli* and intestinal enterococci. Classified into four categories being: "excellent", "good", "sufficient", or "poor", the analyses of these samples consider the results over the current bathing season and the preceding three years instead of a single year's result. In this way, classifications will be less susceptible to bad weather or one-off incidents, and provide results that are more reliable.

Year	Camp Bay No. of occasions of low water quality	
	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2018	0	0
2019	0	0
2020	0	0
2021	0	1

Incidences of Low Water Quality at Camp Bay.

Little Bay No. of occasions of low water quality

Year	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2018	0	1
2019	0	1
2020	0	0
2021	0	0

Incidences of Low Water Quality at Little Bay.

Catalan Bay No. of occasions of low water quality

Year	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2018	0	0
2019	0	1
2020	0	2
2021	0	0

Incidences of Low Water Quality at Catalan Bay.

Sandy Bay No. of occasions of low water quality

Year	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2018	0	0
2019	1	1
2020	0	1
2021	0	0

Incidences of Low Water Quality at Sandy Bay.

Eastern Beach No. of occasions of low water quality

Year	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2018	0	0
2019	0	0
2020	0	0
2021	0	0

Incidences of Low Water Quality at Eastern Beach.

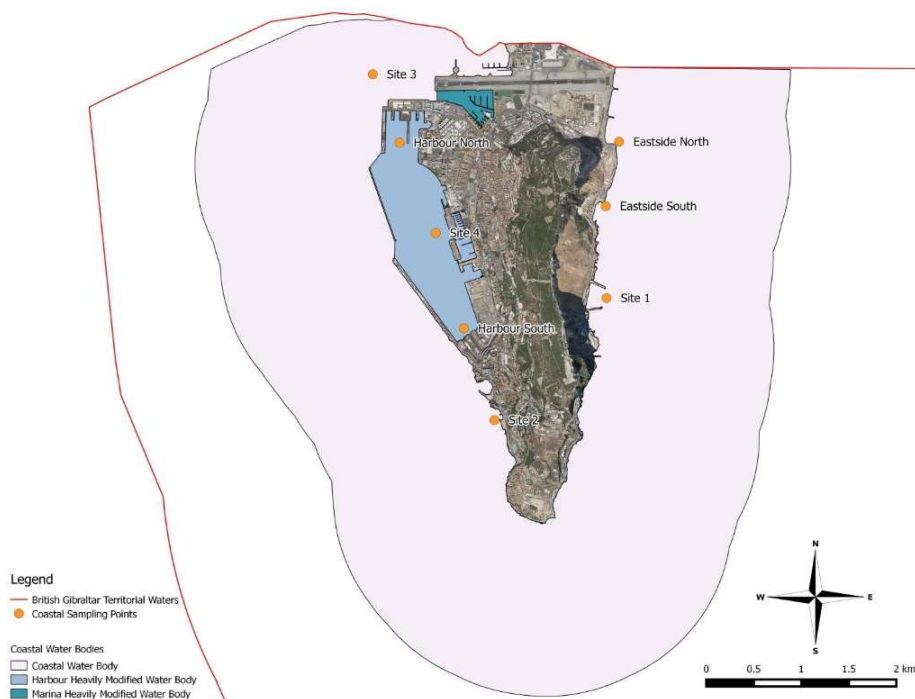
Western Beach No. of occasions of low water quality

Year	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2018	97	88
2019	44	59
2020	9	18
2021	5	14

Incidences of Low Water Quality at Western Beach.

Coastal Water Monitoring

The Department of the Environment and Climate Change carries out coastal water sampling on a regular basis at locations detailed on the map provided. In line with the Water Framework Directive (WFD) 2000/60/EC, a large variety of chemical and physio-chemical parameters are monitored at different locations and frequencies throughout the year.



Coastal water sampling points.

Chemical / physio-chemical parameters	Frequency
General	
Temperature	Monthly
Nutrient status - Total N, Total P, NO ₃ , NO ₂ , NH ₄ , PO ₄	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 (gamma-isomer, Lindane)	4 times per year
Simazine	4 times per year
Trifluralin	4 times per year

Metals

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

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
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Other hydrocarbons

C10-13-chloroalkanes	4 times per year
Benzene	4 times per year

BDEs

Brominated diphenylethers	4 times per year
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DEHP

Di(2-ethylhexyl)phthalate	4 times per year
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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
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Benthic macroinvertebrates - Abundance, composition & biomass	Every 6 years
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Coastal Monthly and Quarterly Data for 2021

Quarterly parameters		Site 1 - Sandy Bay 03/02/2021	Site 2 - Camp Bay 03/02/2021	Site 3 - Northwest 03/02/2021	Site 4 - Mid harbour 03/02/2021
Analyte	Unit				
Dissolved Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Dissolved Lead	ug/l	<0.4	<0.4	<0.4	<0.4
Dissolved Nickel	ug/l	<0.2	<0.2	<0.2	<0.2
PAH MS					
Naphthalene	ug/l	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	ug/l	<0.01	<0.01	<0.01	<0.01
Acenaphthene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluorene	ug/l	<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.01	<0.01	<0.01	<0.01
Anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Chrysene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(bk)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Indeno(123cd)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Dibenzo(ah)anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01	<0.01	<0.01	<0.01
PAH 16 Total	ug/l	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
VOC MS					
Dichlorodifluoromethane	ug/l	<2	<2	<2	<2
Methyl Tertiary Butyl Ether	ug/l	<0.1	<0.1	<0.1	<0.1
Chloromethane	ug/l	<3	<3	<3	<3
Vinyl Chloride	ug/l	<0.1	<0.1	<0.1	<0.1
Bromomethane	ug/l	<1	<1	<1	<1
Chloroethane	ug/l	<3	<3	<3	<3
Trichlorofluoromethane	ug/l	<3	<3	<3	<3
1,1-Dichloroethene (1,1 DCE)	ug/l	<3	<3	<3	<3
Dichloromethane (DCM)	ug/l	<5	<5	<5	<5
trans-1-2-Dichloroethene	ug/l	<3	<3	<3	<3
1,1-Dichloroethane	ug/l	<3	<3	<3	<3
cis-1-2-Dichloroethene	ug/l	<3	<3	<3	<3
2,2-Dichloropropane	ug/l	<1	<1	<1	<1
Bromochloromethane	ug/l	<2	<2	<2	<2
Chloroform	ug/l	<2	<2	<2	<2
1,1,1-Trichloroethane	ug/l	<2	<2	<2	<2
1,1-Dichloropropene	ug/l	<3	<3	<3	<3

Carbon tetrachloride	ug/l	<2	<2	<2	<2
1,2-Dichloroethane	ug/l	<2	<2	<2	<2
Benzene	ug/l	<0.5	<0.5	<0.5	<0.5
Trichloroethene (TCE)	ug/l	<3	<3	<3	<3
1,2-Dichloropropane	ug/l	<2	<2	<2	<2
Dibromomethane	ug/l	<3	<3	<3	<3
Bromodichloromethane	ug/l	<2	<2	<2	<2
cis-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
Toluene	ug/l	<5	<5	<5	<5
trans-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
1,1,2-Trichloroethane	ug/l	<2	<2	<2	<2
Tetrachloroethene (PCE)	ug/l	<3	<3	<3	<3
1,3-Dichloropropane	ug/l	<2	<2	<2	<2
Dibromochloromethane	ug/l	<2	<2	<2	<2
1,2-Dibromoethane	ug/l	<2	<2	<2	<2
Chlorobenzene	ug/l	<2	<2	<2	<2
1,1,1,2-Tetrachloroethane	ug/l	<2	<2	<2	<2
Ethylbenzene	ug/l	<1	<1	<1	<1
m/p-Xylene	ug/l	<2	<2	<2	<2
o-Xylene	ug/l	<1	<1	<1	<1
Styrene	ug/l	<2	<2	<2	<2
Bromoform	ug/l	<2	<2	<2	<2
Isopropylbenzene	ug/l	<3	<3	<3	<3
1,1,2,2-Tetrachloroethane	ug/l	<4	<4	<4	<4
Bromobenzene	ug/l	<2	<2	<2	<2
1,2,3-Trichloropropane	ug/l	<3	<3	<3	<3
Propylbenzene	ug/l	<3	<3	<3	<3
2-Chlorotoluene	ug/l	<3	<3	<3	<3
1,3,5-Trimethylbenzene	ug/l	<3	<3	<3	<3
4-Chlorotoluene	ug/l	<3	<3	<3	<3
tert-Butylbenzene	ug/l	<3	<3	<3	<3
1,2,4-Trimethylbenzene	ug/l	<3	<3	<3	<3
sec-Butylbenzene	ug/l	<3	<3	<3	<3
4-Isopropyltoluene	ug/l	<3	<3	<3	<3
1,3-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,4-Dichlorobenzene	ug/l	<3	<3	<3	<3
n-Butylbenzene	ug/l	<3	<3	<3	<3
1,2-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,2-Dibromo-3-chloropropane	ug/l	<2	<2	<2	<2
1,2,4-Trichlorobenzene	ug/l	<3	<3	<3	<3
Hexachlorobutadiene	ug/l	<3	<3	<3	<3
Naphthalene	ug/l	<2	<2	<2	<2
1,2,3-Trichlorobenzene	ug/l	<3	<3	<3	<3
PAHs					
2-Chloronaphthalene	ug/l	<1	<1	<1	<1

2-Methylnaphthalene	ug/l	<1	<1	<1	<1
Pesticides					
Aldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Alpha-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Beta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Chlorothalonil	ug/l	<2.50	<2.50	<2.50	<2.50
cis-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01
Delta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Dieldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan I	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan II	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan sulphate	ug/l	<0.01	<0.01	<0.01	<0.01
Endrin	ug/l	<0.01	<0.01	<0.01	<0.01
Gamma-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Heptachlor	ug/l	<0.01	<0.01	<0.01	<0.01
Heptachlor Epoxide	ug/l	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	ug/l	<0.01	<0.01	<0.01	<0.01
Isodrin	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDT	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-TDE	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-DDT	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-TDE	ug/l	<0.01	<0.01	<0.01	<0.01
Pendimethalin	ug/l	<0.01	<0.01	<0.01	<0.01
Permethrin I	ug/l	<0.01	<0.01	<0.01	<0.01
Permethrin II	ug/l	<0.01	<0.01	<0.01	<0.01
Quintozene (PCNB)	ug/l	<0.01	<0.01	<0.01	<0.01
Tecnazene	ug/l	<0.01	<0.01	<0.01	<0.01
Telodrin	ug/l	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01
Triadimefon	ug/l	<0.01	<0.01	<0.01	<0.01
Triallate	ug/l	<0.01	<0.01	<0.01	<0.01
Trifluralin	ug/l	<0.01	<0.01	<0.01	<0.01
Dibutyltin	ug/l	<0.1	<0.1	<0.1	<0.1
Tributyltin	ug/l	<0.1	<0.1	<0.1	<0.1
Triphenyltin	ug/l	<0.1	<0.1	<0.1	<0.1

February 2021 Coastal Monitoring Results.

Monthly parameters		Site 1 - Sandy Bay 22/03/2021	Site 2 - Camp Bay 22/03/2021	Site 3 - Northwest 22/03/2021	Site 4 - Mid harbour 22/03/2021
Analyte	Units				
Dissolved Phosphorus	ug/l	<5	<5	<5	<5

Nitrate as NO3	mg/l	<0.2	<0.2	<0.2	1.2
Nitrite as NO2	mg/l	<0.02	<0.02	<0.02	<0.02
Orthophosphate as PO4	mg/l	<0.06	<0.06	<0.06	<0.06
Total Oxidised nitrogen as N	mg/l	<0.2	<0.2	<0.2	0.3
Ammoniacal Nitrogen as N	mg/l	0.57	0.58	0.57	0.58
Total Nitrogen	mg/l	<0.5	0.8	<0.5	1.0
Total Solids	mg/l	39570	39363	37500	40298
Chlorophyll A	ug/l	<7	<7	<7	<7

March 2021 Coastal Monitoring Results.

Monthly parameters		Site 1 - Sandy Bay 09/06/2021	Site 2 - Camp Bay 09/06/2021	Site 3 - Northwest 09/06/2021	Site 4 - Mid harbour 09/06/2021
Analyte	Units				
Dissolved Phosphorus	ug/l	<5	<5	<5	<5
Nitrate as NO3	mg/l	<0.2	<0.2	<0.2	<0.2
Nitrite as NO2	mg/l	<0.02	<0.02	<0.02	<0.02
Orthophosphate as PO4	mg/l	<0.06	<0.06	<0.06	<0.06
Total Oxidised nitrogen as N	mg/l	<0.2	<0.2	<0.2	<0.2
Ammoniacal Nitrogen as N	mg/l	0.55	0.56	0.56	0.58
Total Nitrogen	mg/l	<0.5	<0.5	<0.5	<0.5
Total Solids	mg/l	39589	40041	39880	40365
Chlorophyll A	ug/l	<7	<7	<7	<7

June 2021 Coastal Monitoring Results.

Quarterly parameters		Site 1 - Sandy Bay 31/08/2021	Site 2 - Camp Bay 31/08/2021	Site 3 - Northwest 31/08/2021	Site 4 - Mid harbour 31/08/2021
Analyte	Units				
Dissolved Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Dissolved Lead	ug/l	<0.4	<0.4	<0.4	<0.4
Dissolved Nickel	ug/l	<0.2	<0.2	<0.2	<0.2
PAH MS					
Naphthalene	ug/l	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	ug/l	<0.013	<0.013	<0.013	<0.013
Acenaphthene	ug/l	<0.013	<0.013	<0.013	<0.013
Fluorene	ug/l	<0.014	<0.014	<0.014	<0.014
Phenanthrene	ug/l	<0.011	<0.011	<0.011	<0.011
Anthracene	ug/l	<0.013	<0.013	<0.013	<0.013
Fluoranthene	ug/l	<0.012	<0.012	<0.012	<0.012
Pyrene	ug/l	<0.013	<0.013	<0.013	<0.013
Benzo(a)anthracene	ug/l	<0.015	<0.015	<0.015	<0.015

Chrysene	ug/l	<0.011	<0.011	<0.011	<0.011
Benzo(bk)fluoranthene	ug/l	<0.018	<0.018	<0.018	<0.018
Benzo(a)pyrene	ug/l	<0.016	<0.016	<0.016	<0.016
Indeno(123cd)pyrene	ug/l	<0.011	<0.011	<0.011	<0.011
Dibenzo(ah)anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.011	<0.011	<0.011	<0.011
PAH 16 Total	ug/l	<0.195	<0.195	<0.195	<0.195
Benzo(b)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
VOC MS					
Dichlorodifluoromethane	ug/l	<2	<2	<2	<2
Methyl Tertiary Butyl Ether	ug/l	<0.1	<0.1	<0.1	<0.1
Chloromethane	ug/l	<3	<3	<3	<3
Vinyl Chloride	ug/l	<0.1	<0.1	<0.1	<0.1
Bromomethane	ug/l	<1	<1	<1	<1
Chloroethane	ug/l	<3	<3	<3	<3
Trichlorofluoromethane	ug/l	<3	<3	<3	<3
1,1-Dichloroethene (1,1 DCE)	ug/l	<3	<3	<3	<3
Dichloromethane (DCM)	ug/l	<3	<3	<3	<3
trans-1-2-Dichloroethene	ug/l	<3	<3	<3	<3
1,1-Dichloroethane	ug/l	<3	<3	<3	<3
cis-1-2-Dichloroethene	ug/l	<3	<3	<3	<3
2,2-Dichloropropane	ug/l	<1	<1	<1	<1
Bromochloromethane	ug/l	<2	<2	<2	<2
Chloroform	ug/l	<2	<2	<2	<2
1,1,1-Trichloroethane	ug/l	<2	<2	<2	<2
1,1-Dichloropropene	ug/l	<3	<3	<3	<3
Carbon tetrachloride	ug/l	<2	<2	<2	<2
1,2-Dichloroethane	ug/l	<2	<2	<2	<2
Benzene	ug/l	<0.5	<0.5	<0.5	<0.5
Trichloroethene (TCE)	ug/l	<3	<3	<3	<3
1,2-Dichloropropane	ug/l	<2	<2	<2	<2
Dibromomethane	ug/l	<3	<3	<3	<3
Bromodichloromethane	ug/l	<2	<2	<2	<2
cis-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
Toluene	ug/l	<5	<5	<5	<5
trans-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
1,1,2-Trichloroethane	ug/l	<2	<2	<2	<2
Tetrachloroethene (PCE)	ug/l	<3	<3	<3	<3
1,3-Dichloropropane	ug/l	<2	<2	<2	<2
Dibromochloromethane	ug/l	<2	<2	<2	<2
1,2-Dibromoethane	ug/l	<2	<2	<2	<2
Chlorobenzene	ug/l	<2	<2	<2	<2

1,1,1,2-Tetrachloroethane	ug/l	<2	<2	<2	<2
Ethylbenzene	ug/l	<1	<1	<1	<1
m/p-Xylene	ug/l	<2	<2	<2	<2
o-Xylene	ug/l	<1	<1	<1	<1
Styrene	ug/l	<2	<2	<2	<2
Bromoform	ug/l	<2	<2	<2	<2
Isopropylbenzene	ug/l	<3	<3	<3	<3
1,1,2,2-Tetrachloroethane	ug/l	<4	<4	<4	<4
Bromobenzene	ug/l	<2	<2	<2	<2
1,2,3-Trichloropropane	ug/l	<3	<3	<3	<3
Propylbenzene	ug/l	<3	<3	<3	<3
2-Chlorotoluene	ug/l	<3	<3	<3	<3
1,3,5-Trimethylbenzene	ug/l	<3	<3	<3	<3
4-Chlorotoluene	ug/l	<3	<3	<3	<3
tert-Butylbenzene	ug/l	<3	<3	<3	<3
1,2,4-Trimethylbenzene	ug/l	<3	<3	<3	<3
sec-Butylbenzene	ug/l	<3	<3	<3	<3
4-Isopropyltoluene	ug/l	<3	<3	<3	<3
1,3-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,4-Dichlorobenzene	ug/l	<3	<3	<3	<3
n-Butylbenzene	ug/l	<3	<3	<3	<3
1,2-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,2-Dibromo-3-chloropropane	ug/l	<2	<2	<2	<2
1,2,4-Trichlorobenzene	ug/l	<3	<3	<3	<3
Hexachlorobutadiene	ug/l	<3	<3	<3	<3
Naphthalene	ug/l	<2	<2	<2	<2
1,2,3-Trichlorobenzene	ug/l	<3	<3	<3	<3
PAHs					
2-Chloronaphthalene	ug/l	<1	<1	<1	<1
2-Methylnaphthalene	ug/l	<1	<1	<1	<1
Pesticides					
Aldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Alpha-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Beta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Chlorothalonil	ug/l	<0.01	<0.01	<0.01	<0.01
cis-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01
Delta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Dieldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan I	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan II	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan sulphate	ug/l	<0.01	<0.01	<0.01	<0.01
Endrin	ug/l	<0.01	<0.01	<0.01	<0.01
Gamma-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Heptachlor	ug/l	<0.01	<0.01	<0.01	<0.01

Heptachlor Epoxide	ug/l	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	ug/l	<0.01	<0.01	<0.01	<0.01
Isodrin	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDT	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-TDE	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-DDT	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-TDE	ug/l	<0.01	<0.01	<0.01	<0.01
Pendimethalin	ug/l	<0.01	<0.01	<0.01	<0.01
Permethrin I	ug/l	<0.01	<0.01	<0.01	<0.01
Permethrin II	ug/l	<0.01	<0.01	<0.01	<0.01
Quintozene (PCNB)	ug/l	<0.01	<0.01	<0.01	<0.01
Tecnazene	ug/l	<0.01	<0.01	<0.01	<0.01
Telodrin	ug/l	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01
Triadimefon	ug/l	<0.01	<0.01	<0.01	<0.01
Triallate	ug/l	<0.01	<0.01	<0.01	<0.01
Trifluralin	ug/l	<0.01	<0.01	<0.01	<0.01
Dibutyltin	ug/l	<0.1	<0.1	<0.1	<0.1
Tributyltin	ug/l	<0.1	<0.1	<0.1	<0.1
Triphenyltin	ug/l	<0.1	<0.1	<0.1	<0.1

August 2021 Coastal Monitoring Results.

Monthly parameters		Site 1 - Sandy	Site 2 - Camp	Site 3 -	Site 4 - Mid
		Bay	Bay	Northwest	harbour
		29/09/2021	29/09/2021	29/09/2021	29/09/2021
Analyte	Units				
Dissolved Phosphorus	ug/l	<5	<5	<5	<5
Nitrate as NO3	mg/l	<0.2	<0.2	<0.2	<0.2
Nitrite as NO2	mg/l	<0.02	<0.02	<0.02	<0.02
Orthophosphate as PO4	mg/l	<0.06	<0.06	<0.06	<0.06
Total Oxidised nitrogen as N	mg/l	<0.2	<0.2	<0.2	<0.2
Ammoniacal Nitrogen as N	mg/l	0.54	0.57	0.60	0.56
Total Nitrogen	mg/l	1.1	1.6	1.2	1.7
Total Solids	mg/l	39954	38974	38892	38526
Chlorophyll A	ug/l	<7	<7	<7	<7

September 2021 Coastal Monitoring Results.

Monthly parameters		Site 1 - Sandy Bay 19/10/2021	Site 2 - Camp Bay 19/10/2021	Site 3 - Northwest 19/10/2021	Site 4 - Mid harbour 19/10/2021
Analyte	Units				
Dissolved Phosphorus	ug/l	<5	<5	<5	<5
Nitrate as NO3	mg/l	<0.2	<0.2	<0.2	<0.2
Nitrite as NO2	mg/l	<0.02	<0.02	<0.02	<0.02
Orthophosphate as PO4	mg/l	<0.06	<0.06	<0.06	<0.06
Total Oxidised nitrogen as N	mg/l	<0.2	<0.2	<0.2	<0.2
Ammoniacal Nitrogen as N	mg/l	0.56	0.57	0.55	0.58
Total Nitrogen	mg/l	1.1	1.6	1.2	1.7
Total Solids	mg/l	39762	39168	38196	39412
Chlorophyll A	ug/l	<7	<7	<7	<7

October 2021 Coastal Monitoring Results.

Quarterly parameters		Site 1 - Sandy Bay 23/11/2021	Site 2 - Camp Bay 23/11/2021	Site 3 - Northwest 23/11/2021	Site 4 - Mid harbour 23/11/2021
Analyte	Units				
Dissolved Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Dissolved Lead	ug/l	<0.4	<0.4	<0.4	<0.4
Dissolved Nickel	ug/l	<0.2	<0.2	<0.2	<0.2
PAH MS					
Naphthalene	ug/l	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	ug/l	<0.01	<0.01	<0.01	<0.01
Acenaphthene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluorene	ug/l	<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.01	<0.01	<0.01	<0.01
Anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Chrysene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(bk)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Indeno(123cd)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Dibenzo(ah)anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01	<0.01	<0.01	<0.01
PAH 16 Total	ug/l	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
VOC MS					
Dichlorodifluoromethane	ug/l	<2	<2	<2	<2
Methyl Tertiary Butyl Ether	ug/l	<0.1	<0.1	<0.1	<0.1

Chloromethane	ug/l	<3	<3	<3	<3
Vinyl Chloride	ug/l	<0.1	<0.1	<0.1	<0.1
Bromomethane	ug/l	<1	<1	<1	<1
Chloroethane	ug/l	<3	<3	<3	<3
Trichlorofluoromethane	ug/l	<3	<3	<3	<3
1,1-Dichloroethene (1,1 DCE)	ug/l	<3	<3	<3	<3
Dichloromethane (DCM)	ug/l	<3	<3	<3	<3
trans-1-2-Dichloroethene	ug/l	<3	<3	<3	<3
1,1-Dichloroethane	ug/l	<3	<3	<3	<3
cis-1-2-Dichloroethene	ug/l	<3	<3	<3	<3
2,2-Dichloropropane	ug/l	<1	<1	<1	<1
Bromochloromethane	ug/l	<2	<2	<2	<2
Chloroform	ug/l	<2	<2	<2	<2
1,1,1-Trichloroethane	ug/l	<2	<2	<2	<2
1,1-Dichloropropene	ug/l	<3	<3	<3	<3
Carbon tetrachloride	ug/l	<2	<2	<2	<2
1,2-Dichloroethane	ug/l	<2	<2	<2	<2
Benzene	ug/l	<0.5	<0.5	<0.5	<0.5
Trichloroethene (TCE)	ug/l	<3	<3	<3	<3
1,2-Dichloropropane	ug/l	<2	<2	<2	<2
Dibromomethane	ug/l	<3	<3	<3	<3
Bromodichloromethane	ug/l	<2	<2	<2	<2
cis-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
Toluene	ug/l	<5	<5	<5	<5
trans-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
1,1,2-Trichloroethane	ug/l	<2	<2	<2	<2
Tetrachloroethene (PCE)	ug/l	<3	<3	<3	<3
1,3-Dichloropropane	ug/l	<2	<2	<2	<2
Dibromochloromethane	ug/l	<2	<2	<2	<2
1,2-Dibromoethane	ug/l	<2	<2	<2	<2
Chlorobenzene	ug/l	<2	<2	<2	<2
1,1,1,2-Tetrachloroethane	ug/l	<2	<2	<2	<2
Ethylbenzene	ug/l	<1	<1	<1	<1
m/p-Xylene	ug/l	<2	<2	<2	<2
o-Xylene	ug/l	<1	<1	<1	<1
Styrene	ug/l	<2	<2	<2	<2
Bromoform	ug/l	<2	<2	<2	<2
Isopropylbenzene	ug/l	<3	<3	<3	<3
1,1,2,2-Tetrachloroethane	ug/l	<4	<4	<4	<4
Bromobenzene	ug/l	<2	<2	<2	<2
1,2,3-Trichloropropane	ug/l	<3	<3	<3	<3
Propylbenzene	ug/l	<3	<3	<3	<3
2-Chlorotoluene	ug/l	<3	<3	<3	<3

1,3,5-Trimethylbenzene	ug/l	<3	<3	<3	<3
4-Chlorotoluene	ug/l	<3	<3	<3	<3
tert-Butylbenzene	ug/l	<3	<3	<3	<3
1,2,4-Trimethylbenzene	ug/l	<3	<3	<3	<3
sec-Butylbenzene	ug/l	<3	<3	<3	<3
4-Isopropyltoluene	ug/l	<3	<3	<3	<3
1,3-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,4-Dichlorobenzene	ug/l	<3	<3	<3	<3
n-Butylbenzene	ug/l	<3	<3	<3	<3
1,2-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,2-Dibromo-3-chloropropane	ug/l	<2	<2	<2	<2
1,2,4-Trichlorobenzene	ug/l	<3	<3	<3	<3
Hexachlorobutadiene	ug/l	<3	<3	<3	<3
Naphthalene	ug/l	<2	<2	<2	<2
1,2,3-Trichlorobenzene	ug/l	<3	<3	<3	<3
PAHs					
2-Chloronaphthalene	ug/l	<1	<1	<1	<1
2-Methylnaphthalene	ug/l	<1	<1	<1	<1
Pesticides					
Aldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Alpha-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Beta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Chlorothalonil	ug/l	<2.50	<2.50	<2.50	<2.50
cis-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01
Delta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Dieldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan I	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan II	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan sulphate	ug/l	<0.01	<0.01	<0.01	<0.01
Endrin	ug/l	<0.01	<0.01	<0.01	<0.01
Gamma-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Heptachlor	ug/l	<0.01	<0.01	<0.01	<0.01
Heptachlor Epoxide	ug/l	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	ug/l	<0.01	<0.01	<0.01	<0.01
Isodrin	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDT	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-TDE	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-DDT	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-TDE	ug/l	<0.01	<0.01	<0.01	<0.01
Pendimethalin	ug/l	<0.01	<0.01	<0.01	<0.01
Permethrin I	ug/l	<0.01	<0.01	<0.01	<0.01

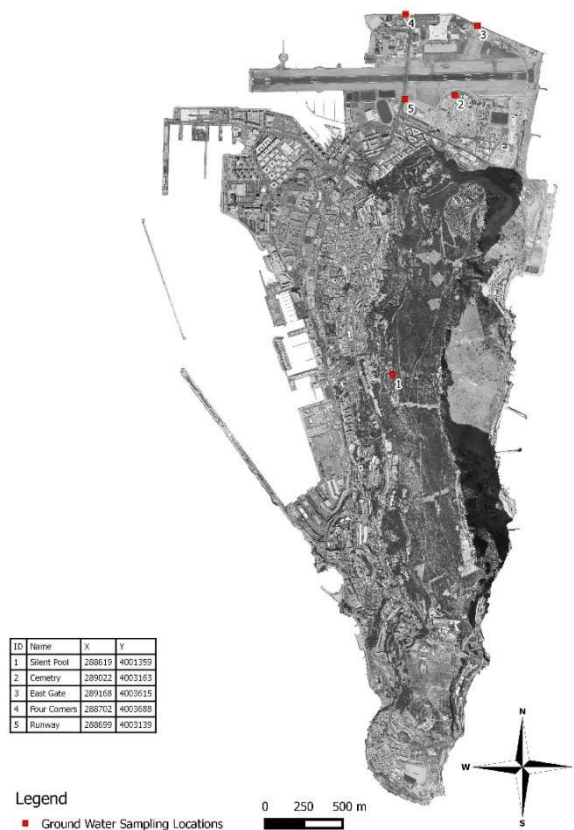
Permethrin II	ug/l	<0.01	<0.01	<0.01	<0.01
Quintozene (PCNB)	ug/l	<0.01	<0.01	<0.01	<0.01
Tecnazene	ug/l	<0.01	<0.01	<0.01	<0.01
Telodrin	ug/l	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01
Triadimefon	ug/l	<0.01	<0.01	<0.01	<0.01
Triallate	ug/l	<0.01	<0.01	<0.01	<0.01
Trifluralin	ug/l	<0.01	<0.01	<0.01	<0.01
Dibutyltin	ug/l	<0.1	<0.1	<0.1	<0.1
Tributyltin	ug/l	<0.1	<0.1	<0.1	<0.1
Triphenyltin	ug/l	<0.1	<0.1	<0.1	<0.1

November 2021 Coastal Monitoring Results.

Coastal results for 2021 are all compliant with thresholds of the Water Framework Directive (WFD) 2000/60/EC.

Groundwater Monitoring

As part of the Water Framework Directive (WFD) 2000/60/EC, the Department of the Environment and Climate Change also operates a groundwater monitoring programme where a specific range of chemical/physio-chemical parameters are recorded on a quarterly basis. Readings are taken at four monitoring points in the Northern Isthmus aquifer and 1 monitoring point in the Southern bedrock aquifer as illustrated below.



Groundwater sampling points.

Groundwater Quarterly Data for 2021

		Site 1 - Silent Pool 19/04/2021	Site 2 - North Front Cemetery 19/04/2021	Site 4 - Four Corners 19/04/2021	Site 5 - Runway 19/04/2021
Analyte	Units				
Dissolved Arsenic	ug/l	<0.9	3.5	11.1	7
Dissolved Cadmium	ug/l	<0.03	<0.03	<0.03	0.04
Dissolved Lead	ug/l	<0.4	<0.4	<0.4	<0.4
Dissolved Zinc	ug/l	91	62.8	34.8	33
Dissolved Calcium	mg/l	89.8	60.7	92.1	101.1
Dissolved Magnesium	mg/l	58.1	5.1	18.3	41.5
Dissolved Potassium	mg/l	15	5.8	8.6	19.1
Dissolved Sodium	mg/l	430.5	20.5	41	284.7
Mercury Dissolved by CVAF	ug/l	<0.01	<0.01	<0.01	<0.01
VOC MS					
Dichlorodifluoromethane	ug/l	<2	<2	<2	<2
Methyl Tertiary Butyl Ether	ug/l	<0.1	<0.1	<0.1	<0.1
Chloromethane	ug/l	<3	<3	<3	<3
Vinyl Chloride	ug/l	<0.1	<0.1	<0.1	<0.1
Bromomethane	ug/l	<1	<1	<1	<1
Chloroethane	ug/l	<3	<3	<3	<3
Trichlorofluoromethane	ug/l	<3	<3	<3	<3
1,1-Dichloroethene (1,1 DCE)	ug/l	<3	<3	<3	<3
Dichloromethane (DCM)	ug/l	<5	<5	<5	<5
trans-1-2-Dichloroethene	ug/l	<3	<3	<3	<3
1,1-Dichloroethane	ug/l	<3	<3	<3	<3
cis-1-2-Dichloroethene	ug/l	<3	<3	<3	<3
2,2-Dichloropropan	ug/l	<1	<1	<1	<1
Bromochloromethane	ug/l	<2	<2	<2	<2
Chloroform	ug/l	<2	<2	<2	<2
1,1,1-Trichloroethane	ug/l	<2	<2	<2	<2
1,1-Dichloropropene	ug/l	<3	<3	<3	<3
Carbon tetrachloride	ug/l	<2	<2	<2	<2
1,2-Dichloroethane	ug/l	<2	<2	<2	<2
Benzene	ug/l	<0.5	<0.5	<0.5	<0.5
Trichloroethene (TCE)	ug/l	<3	<3	<3	<3
1,2-Dichloropropane	ug/l	<2	<2	<2	<2
Dibromomethane	ug/l	<3	<3	<3	<3
Bromodichloromethane	ug/l	<2	<2	<2	<2
cis-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
Toluene	ug/l	<5	<5	<5	<5

trans-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
1,1,2-Trichloroethane	ug/l	<2	<2	<2	<2
Tetrachloroethene (PCE)	ug/l	<3	<3	<3	<3
1,3-Dichloropropane	ug/l	<2	<2	<2	<2
Dibromochloromethane	ug/l	<2	<2	<2	<2
1,2-Dibromoethane	ug/l	<2	<2	<2	<2
Chlorobenzene	ug/l	<2	<2	<2	<2
1,1,1,2-Tetrachloroethane	ug/l	<2	<2	<2	<2
Ethylbenzene	ug/l	<1	<1	<1	<1
m/p-Xylene	ug/l	<2	<2	<2	<2
o-Xylene	ug/l	<1	<1	<1	<1
Styrene	ug/l	<2	<2	<2	<2
Bromoform	ug/l	<2	<2	<2	<2
Isopropylbenzene	ug/l	<3	<3	<3	<3
1,1,2,2-Tetrachloroethane	ug/l	<4	<4	<4	<4
Bromobenzene	ug/l	<2	<2	<2	<2
1,2,3-Trichloropropane	ug/l	<3	<3	<3	<3
Propylbenzene	ug/l	<3	<3	<3	<3
2-Chlorotoluene	ug/l	<3	<3	<3	<3
1,3,5-Trimethylbenzene	ug/l	<3	<3	<3	<3
4-Chlorotoluene	ug/l	<3	<3	<3	<3
tert-Butylbenzene	ug/l	<3	<3	<3	<3
1,2,4-Trimethylbenzene	ug/l	<3	<3	<3	<3
sec-Butylbenzene	ug/l	<3	<3	<3	<3
4-Isopropyltoluene	ug/l	<3	<3	<3	<3
1,3-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,4-Dichlorobenzene	ug/l	<3	<3	<3	<3
n-Butylbenzene	ug/l	<3	<3	<3	<3
1,2-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,2-Dibromo-3-chloropropane	ug/l	<2	<2	<2	<2
1,2,4-Trichlorobenzene	ug/l	<3	<3	<3	<3
Hexachlorobutadiene	ug/l	<3	<3	<3	<3
Naphthalene	ug/l	<2	<2	<2	<2
1,2,3-Trichlorobenzene	ug/l	<3	<3	<3	<3
Surrogate Recovery Toluene D8	%	104	113	116	109
Surrogate Recovery 4-Bromofluorobenzene	%	91	99	99	96
Phenols					
2-Chlorophenol	ug/l	<1	<1	<1	<1
2-Methylphenol	ug/l	<0.5	<0.5	<0.5	<0.5
2-Nitrophenol	ug/l	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	ug/l	<0.5	<0.5	<0.5	<0.5

2,4-Dimethylphenol	ug/l	<1	<1	<1	<1
2,4,5-Trichlorophenol	ug/l	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	ug/l	<1	<1	<1	<1
4-Chloro-3-methylphenol	ug/l	<0.5	<0.5	<0.5	<0.5
4-Methylphenol	ug/l	<1	<1	<1	<1
4-Nitrophenol	ug/l	<10	<10	<10	<10
Pentachlorophenol	ug/l	<1	<1	<1	<1
Phenol	ug/l	<1	<1	<1	<1
PAHs					
2-Chloronaphthalene	ug/l	<1	<1	<1	<1
2-Methylnaphthalene	ug/l	<1	<1	<1	<1
Organochlorine					
Pesticides					
Aldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Alpha-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Beta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Chlorothalonil	ug/l	<2.50	<2.50	<2.50	<2.50
cis-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01
Delta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Dieldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan I	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan II	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan sulphate	ug/l	<0.01	<0.01	<0.01	<0.01
Endrin	ug/l	<0.01	<0.01	<0.01	<0.01
Gamma-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Heptachlor	ug/l	<0.01	<0.01	<0.01	<0.01
Heptachlor Epoxide	ug/l	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	ug/l	<0.01	<0.01	<0.01	<0.01
Isodrin	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDT	ug/l	<0.01	<0.01	<0.01	0.01
o,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-TDE	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	ug/l	<0.01	<0.01	<0.01	0.09
p,p'-DDT	ug/l	<0.01	<0.01	<0.01	0.06
p,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-TDE	ug/l	<0.01	<0.01	<0.01	0.02
Pendimethalin	ug/l	<0.01	<0.01	<0.01	<0.01
Permethrin I	ug/l	<0.01	<0.01	<0.01	<0.01
Permethrin II	ug/l	<0.01	<0.01	<0.01	<0.01
Quintozone (PCNB)	ug/l	<0.01	<0.01	<0.01	<0.01
Tecnazene	ug/l	<0.01	<0.01	<0.01	<0.01
Telodrin	ug/l	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01
Triadimefon	ug/l	<0.01	<0.01	<0.01	<0.01
Triallate	ug/l	<0.01	<0.01	<0.01	<0.01

Trifluralin	ug/l	<0.01	<0.01	<0.01	<0.01
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April 2021 Groundwater Monitoring Results.

		Site 1 - Silent Pool 04/08/2021	Site 2 - North Front Cemetery 04/08/2021	Site 4 - Four Corners 04/08/2021	Site 5 - Runway 04/08/2021
Analyte	Units				
Dissolved Arsenic	ug/l	<0.9	3.5	14.8	6.8
Dissolved Cadmium	ug/l	<0.03	<0.03	<0.03	0.04
Dissolved Lead	ug/l	<0.4	<0.4	<0.4	<0.4
Dissolved Zinc	ug/l	17	209.9	149	27.2
Dissolved Calcium	mg/l	107.8	69.6	93.4	88.5
Dissolved Magnesium	mg/l	83.9	6.1	18.6	42
Dissolved Potassium	mg/l	22.5	7.1	8.8	21.9
Dissolved Sodium	mg/l	565.3	21.2	44.6	363.8
Mercury Dissolved by CVAF	ug/l	<0.01	<0.01	<0.01	<0.01
VOC MS					
Dichlorodifluoromethane	ug/l	<2	<2	<2	<2
Methyl Tertiary Butyl Ether	ug/l	<0.1	<0.1	<0.1	<0.1
Chloromethane	ug/l	<3	<3	<3	<3
Vinyl Chloride	ug/l	<0.1	<0.1	<0.1	<0.1
Bromomethane	ug/l	<1	<1	<1	<1
Chloroethane	ug/l	<3	<3	<3	<3
Trichlorofluoromethane	ug/l	<3	<3	<3	<3
1,1-Dichloroethene (1,1 DCE)	ug/l	<3	<3	<3	<3
Dichloromethane (DCM)	ug/l	<3	<3	<3	<3
trans-1-2-Dichloroethene	ug/l	<3	<3	<3	<3
1,1-Dichloroethane	ug/l	<3	<3	<3	<3
cis-1-2-Dichloroethene	ug/l	<3	<3	<3	<3
2,2-Dichloropropan	ug/l	<1	<1	<1	<1
Bromochloromethane	ug/l	<2	<2	<2	<2
Chloroform	ug/l	<2	<2	<2	<2
1,1,1-Trichloroethane	ug/l	<2	<2	<2	<2
1,1-Dichloropropene	ug/l	<3	<3	<3	<3
Carbon tetrachloride	ug/l	<2	<2	<2	<2
1,2-Dichloroethane	ug/l	<2	<2	<2	<2
Benzene	ug/l	<0.5	<0.5	<0.5	<0.5
Trichloroethene (TCE)	ug/l	<3	<3	<3	<3
1,2-Dichloropropane	ug/l	<2	<2	<2	<2
Dibromomethane	ug/l	<3	<3	<3	<3
Bromodichloromethane	ug/l	<2	<2	<2	<2

cis-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
Toluene	ug/l	<5	<5	<5	<5
trans-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
1,1,2-Trichloroethane	ug/l	<2	<2	<2	<2
Tetrachloroethene (PCE)	ug/l	<3	<3	<3	<3
1,3-Dichloropropane	ug/l	<2	<2	<2	<2
Dibromochloromethane	ug/l	<2	<2	<2	<2
1,2-Dibromoethane	ug/l	<2	<2	<2	<2
Chlorobenzene	ug/l	<2	<2	<2	<2
1,1,1,2-Tetrachloroethane	ug/l	<2	<2	<2	<2
Ethylbenzene	ug/l	<1	<1	<1	<1
m/p-Xylene	ug/l	<2	<2	<2	<2
o-Xylene	ug/l	<1	<1	<1	<1
Styrene	ug/l	<2	<2	<2	<2
Bromoform	ug/l	<2	<2	<2	<2
Isopropylbenzene	ug/l	<3	<3	<3	<3
1,1,1,2-Tetrachloroethane	ug/l	<4	<4	<4	<4
Bromobenzene	ug/l	<2	<2	<2	<2
1,2,3-Trichloropropane	ug/l	<3	<3	<3	<3
Propylbenzene	ug/l	<3	<3	<3	<3
2-Chlorotoluene	ug/l	<3	<3	<3	<3
1,3,5-Trimethylbenzene	ug/l	<3	<3	<3	<3
4-Chlorotoluene	ug/l	<3	<3	<3	<3
tert-Butylbenzene	ug/l	<3	<3	<3	<3
1,2,4-Trimethylbenzene	ug/l	<3	<3	<3	<3
sec-Butylbenzene	ug/l	<3	<3	<3	<3
4-Isopropyltoluene	ug/l	<3	<3	<3	<3
1,3-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,4-Dichlorobenzene	ug/l	<3	<3	<3	<3
n-Butylbenzene	ug/l	<3	<3	<3	<3
1,2-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,2-Dibromo-3-chloropropane	ug/l	<2	<2	<2	<2
1,2,4-Trichlorobenzene	ug/l	<3	<3	<3	<3
Hexachlorobutadiene	ug/l	<3	<3	<3	<3
Naphthalene	ug/l	<2	<2	<2	<2
1,2,3-Trichlorobenzene	ug/l	<3	<3	<3	<3
Surrogate Recovery	%	97	100	98	101
Toluene D8					
Surrogate Recovery 4-Bromofluorobenzene	%	106	110	108	111
Phenols					
2-Chlorophenol	ug/l	<1	<1	<1	<1
2-Methylphenol	ug/l	<0.5	<0.5	<0.5	<0.5

2-Nitrophenol	ug/l	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	ug/l	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	ug/l	<1	<1	<1	<1
2,4,5-Trichlorophenol	ug/l	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	ug/l	<1	<1	<1	<1
4-Chloro-3-methylphenol	ug/l	<0.5	<0.5	<0.5	<0.5
4-Methylphenol	ug/l	<1	<1	<1	<1
4-Nitrophenol	ug/l	<10	<10	<10	<10
Pentachlorophenol	ug/l	<1	<1	<1	<1
Phenol	ug/l	<1	<1	<1	<1
PAHs					
2-Chloronaphthalene	ug/l	<1	<1	<1	<1
2-Methylnaphthalene	ug/l	<1	<1	<1	<1
Organochlorine					
Pesticides					
Aldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Alpha-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Beta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Chlorothalonil	ug/l	<2.50	<2.50	<0.01	<0.01
cis-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01
Delta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Dieldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan I	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan II	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan sulphate	ug/l	<0.01	<0.01	<0.01	<0.01
Endrin	ug/l	<0.01	<0.01	<0.01	<0.01
Gamma-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Heptachlor	ug/l	<0.01	<0.01	<0.01	<0.01
Heptachlor Epoxide	ug/l	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	ug/l	<0.01	<0.01	<0.01	<0.01
Isodrin	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDT	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-TDE	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	ug/l	<0.01	<0.01	<0.01	0.05
p,p'-DDT	ug/l	<0.01	<0.01	0.01	0.03
p,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-TDE	ug/l	<0.01	<0.01	0.02	<0.01
Pendimethalin	ug/l	<0.01	<0.01	<0.01	<0.01
Permethrin I	ug/l	<0.01	<0.01	<0.01	<0.01
Permethrin II	ug/l	<0.01	<0.01	<0.01	<0.01
Quintozene (PCNB)	ug/l	<0.01	<0.01	<0.01	<0.01
Tecnazene	ug/l	<0.01	<0.01	<0.01	<0.01
Telodrin	ug/l	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01

Triadimefon	ug/l	<0.01	<0.01	<0.01	<0.01
Triallate	ug/l	<0.01	<0.01	<0.01	<0.01
Trifluralin	ug/l	<0.01	<0.01	<0.01	<0.01

August 2021 Groundwater Monitoring Results.

		SITE 1 - Silent Pool 08/11/2021	SITE 2 - North Front Cemetery 08/11/2021	SITE 4 - Four Corners 08/11/2021	SITE 5 - Runway 08/11/2021
Analyte	Units				
Dissolved Arsenic	ug/l	<0.9	3.7	11.6	7.1
Dissolved Cadmium	ug/l	<0.03	<0.03	<0.03	0.04
Dissolved Lead	ug/l	0.7	0.6	<0.4	0.5
Dissolved Zinc	ug/l	36.2	69.4	11.0	25.0
Dissolved Calcium	mg/l	109.2	70.2	48.5	108.8
Dissolved Magnesium	mg/l	88.4	5.5	5.5	39.7
Dissolved Potassium	mg/l	22.6	6.9	21.5	18.1
Dissolved Sodium	mg/l	923.2	21.6	203.6	403.11
Mercury Dissolved by CVAF	ug/l	<0.01	<0.01	<0.01	<0.01
VOC MS					
Dichlorodifluoromethane	ug/l	<2	<2	<2	<2
Methyl Tertiary Butyl Ether	ug/l	<0.1	<0.1	<0.1	<0.1
Chloromethane	ug/l	<3	<3	<3	<3
Vinyl Chloride	ug/l	<0.1	<0.1	<0.1	<0.1
Bromomethane	ug/l	<1	<1	<1	<1
Chloroethane	ug/l	<3	<3	<3	<3
Trichlorofluoromethane	ug/l	<3	<3	<3	<3
1,1-Dichloroethene (1,1 DCE)	ug/l	<3	<3	<3	<3
Dichloromethane (DCM)	ug/l	<3	<3	<3	<3
trans-1-2- Dichloroethene	ug/l	<3	<3	<3	<3
1,1-Dichloroethane	ug/l	<3	<3	<3	<3
cis-1-2-Dichloroethene	ug/l	<3	<3	<3	<3
2,2-Dichloropropan	ug/l	<1	<1	<1	<1
Bromochloromethane	ug/l	<2	<2	<2	<2
Chloroform	ug/l	<2	<2	<2	<2
1,1,1-Trichloroethane	ug/l	<2	<2	<2	<2
1,1-Dichloropropene	ug/l	<3	<3	<3	<3
Carbon tetrachloride	ug/l	<2	<2	<2	<2
1,2-Dichloroethane	ug/l	<2	<2	<2	<2
Benzene	ug/l	<0.5	<0.5	<0.5	<0.5
Trichloroethene (TCE)	ug/l	<3	<3	<3	<3
1,2-Dichloropropane	ug/l	<2	<2	<2	<2

Dibromomethane	ug/l	<3	<3	<3	<3
Bromodichloromethane	ug/l	<2	<2	<2	<2
cis-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
Toluene	ug/l	<5	<5	<5	<5
trans-1-3-Dichloropropene	ug/l	<2	<2	<2	<2
1,1,2-Trichloroethane	ug/l	<2	<2	<2	<2
Tetrachloroethene (PCE)	ug/l	<3	<3	<3	<3
1,3-Dichloropropane	ug/l	<2	<2	<2	<2
Dibromochloromethane	ug/l	<2	<2	<2	<2
1,2-Dibromoethane	ug/l	<2	<2	<2	<2
Chlorobenzene	ug/l	<2	<2	<2	<2
1,1,1,2-Tetrachloroethane	ug/l	<2	<2	<2	<2
Ethylbenzene	ug/l	<1	<1	<1	<1
m/p-Xylene	ug/l	<2	<2	<2	<2
o-Xylene	ug/l	<1	<1	<1	<1
Styrene	ug/l	<2	<2	<2	<2
Bromoform	ug/l	<2	<2	<2	<2
Isopropylbenzene	ug/l	<3	<3	<3	<3
1,1,1,2-Tetrachloroethane	ug/l	<4	<4	<4	<4
Bromobenzene	ug/l	<2	<2	<2	<2
1,2,3-Trichloropropane	ug/l	<3	<3	<3	<3
Propylbenzene	ug/l	<3	<3	<3	<3
2-Chlorotoluene	ug/l	<3	<3	<3	<3
1,3,5-Trimethylbenzene	ug/l	<3	<3	<3	<3
4-Chlorotoluene	ug/l	<3	<3	<3	<3
tert-Butylbenzene	ug/l	<3	<3	<3	<3
1,2,4-Trimethylbenzene	ug/l	<3	<3	<3	<3
sec-Butylbenzene	ug/l	<3	<3	<3	<3
4-Isopropyltoluene	ug/l	<3	<3	<3	<3
1,3-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,4-Dichlorobenzene	ug/l	<3	<3	<3	<3
n-Butylbenzene	ug/l	<3	<3	<3	<3
1,2-Dichlorobenzene	ug/l	<3	<3	<3	<3
1,2-Dibromo-3-chloropropane	ug/l	<2	<2	<2	<2
1,2,4-Trichlorobenzene	ug/l	<3	<3	<3	<3
Hexachlorobutadiene	ug/l	<3	<3	<3	<3
Naphthalene	ug/l	<2	<2	<2	<2
1,2,3-Trichlorobenzene	ug/l	<3	<3	<3	<3
Surrogate Recovery Toluene D8	%	106	108	97	110
Surrogate Recovery 4-Bromofluorobenzene	%	103	104	94	104
Phenols					

2-Chlorophenol	ug/l	<1	<1	<1	<1
2-Methylphenol	ug/l	<0.5	<0.5	<0.5	<0.5
2-Nitrophenol	ug/l	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	ug/l	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	ug/l	<1	<1	<1	<1
2,4,5-Trichlorophenol	ug/l	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	ug/l	<1	<1	<1	<1
4-Chloro-3-methylphenol	ug/l	<0.5	<0.5	<0.5	<0.5
4-Methylphenol	ug/l	<1	<1	<1	<1
4-Nitrophenol	ug/l	<10	<10	<10	<10
Pentachlorophenol	ug/l	<1	<1	<1	<1
Phenol	ug/l	<1	<1	<1	<1
PAHs					
2-Chloronaphthalene	ug/l	<1	<1	<1	<1
2-Methylnaphthalene	ug/l	<1	<1	<1	<1
Organochlorine					
Pesticides					
Aldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Alpha-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Beta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Chlorothalonil	ug/l	<2.50	<2.50	<2.50	<2.50
cis-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01
Delta-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Dieldrin	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan I	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan II	ug/l	<0.01	<0.01	<0.01	<0.01
Endosulphan sulphate	ug/l	<0.01	<0.01	<0.01	<0.01
Endrin	ug/l	<0.01	<0.01	<0.01	<0.01
Gamma-HCH (BHC)	ug/l	<0.01	<0.01	<0.01	<0.01
Heptachlor	ug/l	<0.01	<0.01	<0.01	<0.01
Heptachlor Epoxide	ug/l	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	ug/l	<0.01	<0.01	<0.01	<0.01
Isodrin	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-DDT	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
o,p'-TDE	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	ug/l	<0.01	<0.01	<0.01	0.07
p,p'-DDT	ug/l	<0.01	<0.01	<0.01	0.08
p,p'-Methoxychlor	ug/l	<0.01	<0.01	<0.01	<0.01
p,p'-TDE	ug/l	<0.01	<0.01	<0.01	0.01
Pendimethalin	ug/l	<0.01	<0.01	<0.01	<0.01
Permethrin I	ug/l	<0.01	<0.01	<0.01	<0.01
Permethrin II	ug/l	<0.01	<0.01	<0.01	<0.01
Quintozene (PCNB)	ug/l	<0.01	<0.01	<0.01	<0.01
Tecnazene	ug/l	<0.01	<0.01	<0.01	<0.01

Telodrin	ug/l	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	ug/l	<0.01	<0.01	<0.01	<0.01
Triadimefon	ug/l	<0.01	<0.01	<0.01	<0.01
Triallate	ug/l	<0.01	<0.01	<0.01	<0.01
Trifluralin	ug/l	<0.01	<0.01	<0.01	<0.01

November 2021 Groundwater Monitoring Results.

Groundwater results for 2021 are all compliant with thresholds of the Water Framework Directive (WFD) 2000/60/EC.

Habitats

Birds

Nesting Birds of Prey

As part of their work, the Gibraltar Ornithological and Natural History Society (GONHS) conducts bird of prey surveys on an annual basis during the breeding season. Records are kept on the nesting of Peregrines (*Falco peregrinus*), Common Kestrel (*Falco tinnunculus*), and Lesser Kestrel (*Falco naumanni*). These records are shown in the following section.

Lesser and Common Kestrel

Year	Lesser Kestrel	Common Kestrel
2010	16	11
2011	18	9
2012	13	8
2013	5	5
2014	4	6
2015	4	7
2016	1	7
2017	1	8
2018	0	5
2019	0	5
2020	0	6
2021	0	8

Breeding Pairs of Lesser Kestrel & Common Kestrel in Gibraltar.

Peregrine Falcon (young fledged by site)

Year	North Face	Catalan Bay	Sandy Bay	Brian Navarro way	Med Steps	Camp Bay	Europa Point	Apes Den	Rock Hotel	Total
2010	0	0	3	2	0	2	0			7
2011	2	3	3	0		3	3			14
2012	0	3	2	0		1	2	0		8
2013	4	3	3	0	3	0	0			13
2014	3	1	2		0		0			6
2015	2	2	0	3		3	0	0		10
2016	3	3	3	0		3	0	0		14
2017	0	3	3	0	3	0	3	0		12
2018	0	3	3	2	0		3	2		13
2019	2	2	0	2	3		3	0		12
2020	3	0	0	3	0		3	4		13
2021	3	2	2		1	1			4	13

Blank entries denote no pairs present at this site

Locations and Breeding Success of Peregrines in Gibraltar.

Yellow-legged Gulls

The Upper Rock Nature Reserve and the eastern sand slopes continue to be the main nesting sites for Yellow-legged Gulls. As with previous years, licensed culling of yellow-legged gulls continues to take place. The table below provides an indication of the demographics being targeted, and shows that 1534 yellow-legged gulls were culled in 2021. This is 415 less than the previous year.

	Adults	1st/yr	2nd/yr	3rd/yr	Juveniles	Total
Jan	119	21	3	0	0	143
Feb	238	15	5	1	0	259
Mar	282	20	10	13	0	325
Apr	163	0	4	1	0	168
May	164	0	5	0	0	169
Jun	143	0	0	0	52	195
Jul (counts)	0	0	0	0	0	0
Aug (counts)	0	0	0	0	0	0
Sept (counts)	0	0	0	0	0	0
Oct	74	0	0	0	0	74
Nov	133	0	4	0	0	137
Dec	63	0	1	0	0	64
Total	1379	56	32	15	52	1534

Yellow-legged Gulls culled in 2021.

Mammals

Barbary Macaques

Year	Estimated Population	Recorded Deaths	Recorded Births	Recorded Infant Deaths
2014	196	27 (30 exported)	26	7
2015	158	7	39	3
2016	184	8	38	7
2017	198	28	27	8
2018	245	10	23	9
2019	247	10	25	15
2020	273	12	34	4
2021	200	27	17	4

Barbary Macaque demographics.

Rock Gun	20
Middle Hill	27
Cable Car	26
Prince Philips Arch	15
Apes Den	45
O'Hara's Battery	13
Moorish Castle	6
St Michael's Cave	31
Levant	17
Eastside	15

Barbary Macaque population and distribution data 2021.

Waste

Hazardous Waste

Hazardous waste materials are stored under strict licence conditions, and then processed for trans-frontier shipment to destinations where they can be adequately disposed of. Typically consisting of waste oils and asbestos containing products, the table below shows a breakdown of total exported hazardous wastes in 2021.

Waste Code	Description of Waste	Total Exported (tonnes)
19 01 13*	Fly Ash containing dangerous substances	0.57
19 01 11*	Bottom Ash and slag containing dangerous substances	10.42
15 02 02*	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	1.93
16 03 05*	Organic wastes containing dangerous substances	4.19
20 01 35*	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components	29.66
20 01 23*	Discarded equipment containing chlorofluorocarbons	5.75
17 01 07	Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	3655.61
13 07 03*	Other Fuels (Including mixtures)	19355.79
20 03 01 20 03 99	Mixed municipal waste Municipal wastes not otherwise specified	28570.78
16 01 07*	Oil Filters	0.71
15 02 02*	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	7.05
13 07 03*	Other Fuels (Including Mixtures)	0.76
18 01 03*	Waste whose collection is subject to special requirements to prevent infections	159.19

18 01 09	Medicines other than those mentioned in 18 01 08	1.8
18 01 08*	Cytotoxic and cytostatic medicines	1.6
06 02 04*	Sodium and potassium hydroxide	4.1
17 06 05*	Construction materials containing asbestos	0.2
13 07 03*	Other fuels (including mixtures)	22.12
20 01 35*	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components	282.2
16 06 01*	Lead batteries	95.16
16 07 08*	Wastes containing oil	6300
17 09 04	Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	11567.61
13 04 03*	Bilge oils from other navigation	1200
13 07 03*	Other fuels (including mixtures)	6529
13 07 03*	Other fuels (including mixtures)	5897.3

Trans-frontier shipments of hazardous waste in 2021.

Municipal Waste

Month	Refuse (Kgs)	Bulky Items (Kgs)	Mattresses (Kgs)
January	1,275,140	880,300	5,120
February	1,175,940	974,820	8,280
March	1,079,680	938,200	0
April	1,619,020	1,529,060	5,980
May	1,291,400	1,163,760	4,780
June	1,495,760	1,185,460	4,860
July	1,253,980	1,284,200	1,320
August	1,435,420	1,303,480	0
September	1,423,180	1,091,860	0
October	1,254,220	1,490,640	0
November	1,523,300	1,382,740	0
December	1,589,460	1,132,180	0
Total	16,416,500	14,356,700	30,340

* As from August mattresses were included in the statistics under bulky items.

Municipal waste in Gibraltar in 2021.

Recycling

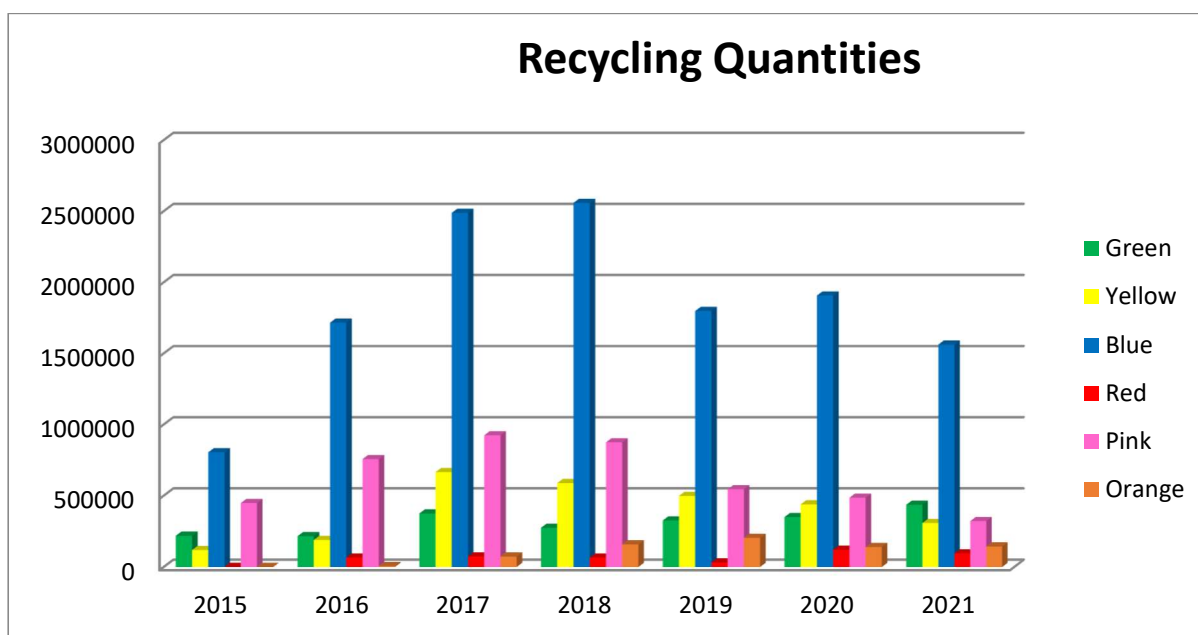
The following data shows rates for recycling in Gibraltar during 2021.

Key	
Bin Colour	Items discarded
Green	Glass
Yellow	Plastic, cans and tetrabrik
Blue	Paper and cardboard
Red	Batteries

Pink Waste Electrical and Electronic Equipment (WEEE)
 Orange Waste cooking oil

Year 2021	Green Bin	Yellow Bin	Blue Bin	Red Bin	Pink Bin	Orange Bin	Total
Kgs	436,000	308,060	1,562,400	95160	321,780	144000	2,628,240

Recycling quantities for 2021.



Recycling quantities (2015-2021).

WEEE

Due to the mixed and often hazardous nature of WEEE, regulations are in place to ensure that all categories of this waste are responsibly handled, treated and disposed of where necessary. The table below highlights which categories are encompassed under this umbrella of enforcement, and details how much is being treated and recovered to create a new life cycle.

Year: 2021 Categories	Imported		Collected		Sent for treatment		Recovery %
	Quantity (No.)	Weight (tonnes)	Quantity (No.)	Weight (tonnes)	Quantity (No.)	Weight (tonnes)	
Large Household appliances	8459	156.913	1419	39.661	7178	286.61	25.27579
Small Household appliances	34633	70.077	104	0.459	1580	5.773	0.654994
IT and Telecoms Equipment	38434.22	52.788	877	19.27525	3870	22.66	36.51445
Consumer Equipment	4986	12.21	270	2.865	677	6.6	23.46437
Lighting equipment	9328	9328	1904	1.564	0	0	0.016767

Electrical and electronic tools	1339	20.561	4	0.03	0	0	0.145907
Toys, Leisure & Sports Equipment	0	7.726	4	0.145	0	0	1.87678
Medical devices	14091	7.188	0	0	82	0.137	0
Monitoring & Control Instruments	280	0.139	0	0	0	0	0
Automatic dispensers	499	1.894	0	0	0	0	0

WEEE movements and recovery in Gibraltar in 2021.

Incineration Waste

Data below shows types and weights of incinerated waste dealt with locally, and exported.

Type of Waste	
Clinical Waste Incinerated (Kgs)	428,820
Clinical waste Exported (Kgs)	174,667.5
Cytotoxic Waste Exported (Kgs)	2,300
Animal Incinerations (Number)	437
Human Cremations (Number)	111
Other wastes Incinerated (Kgs)	7,053.6
Exported	
Fly Ash Exported (Kgs)	2,142
Furnace Ash Exported (Kgs)	16,847

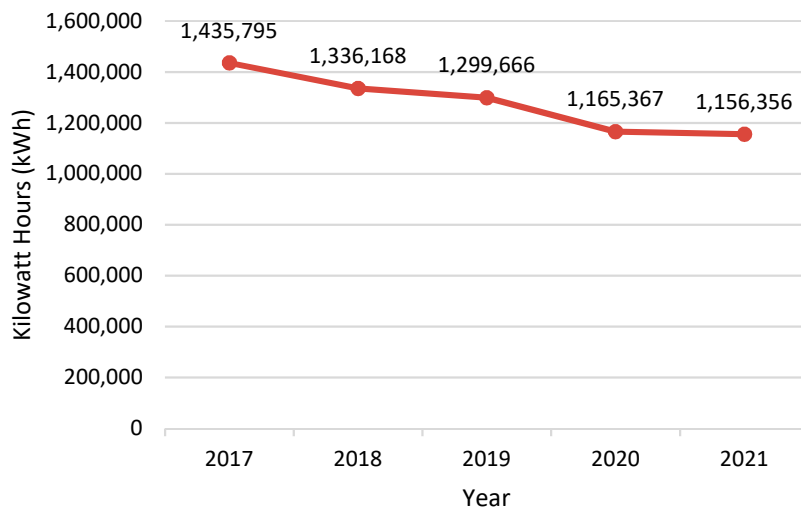
Total amount of clinical waste collected in 2021.

Energy Lighting

As part of H.M. Government's initiative to improve energy efficiency, the Gibraltar Electricity Authority (GEA) has systematically carried out the installation of LED lighting throughout different sectors to reduce energy consumption and consequently carbon emissions. The graphs below illustrate the progress of this programme over the last five years.

Street Lighting

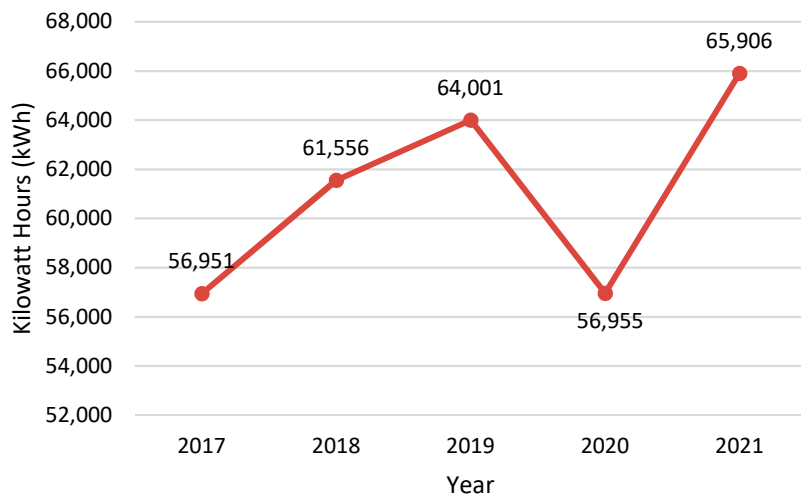
Street lighting consumption (2017-2021)



Street lighting consumption (2017-2021).

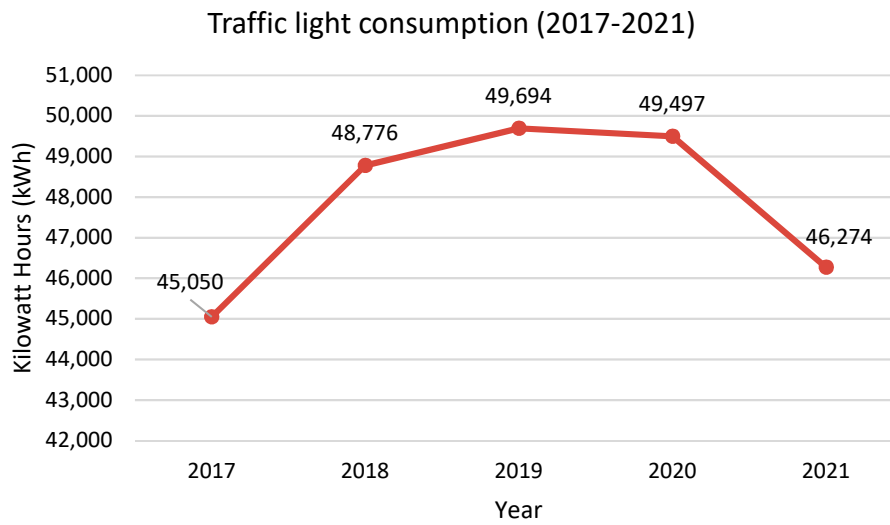
Flood Lighting

Flood lighting consumption (2017-2021)



Flood lighting consumption (2017-2021).

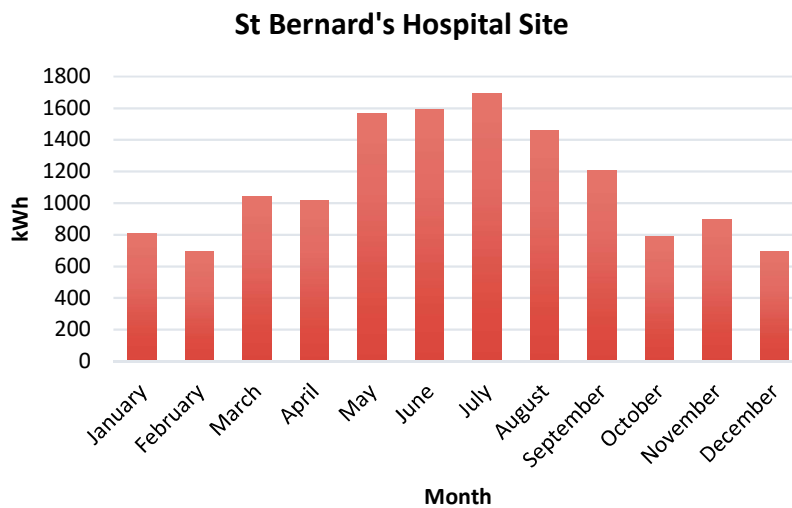
Traffic Lighting



Traffic light consumption (2017-2021).

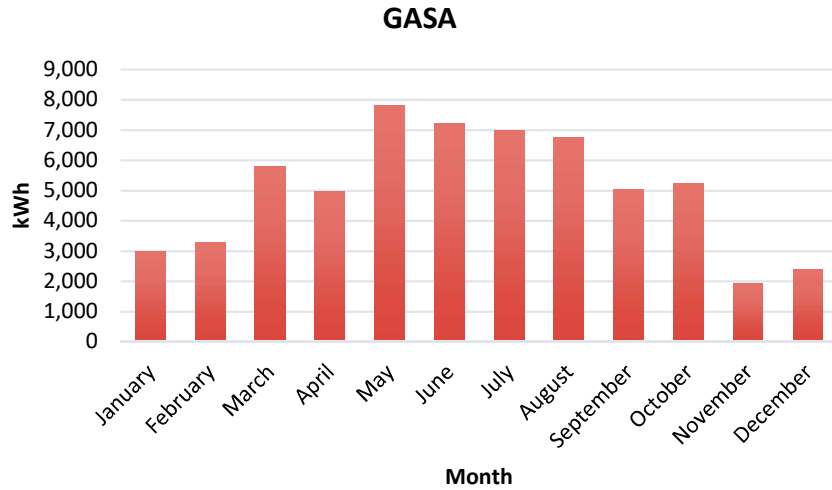
Solar Energy

In line with EU targets for sourcing 20% of energy by 2020, H.M. Government of Gibraltar currently has a variety of solar energy projects in place with plans to increase this further. A breakdown of energy produced at some existing sites is shown below.



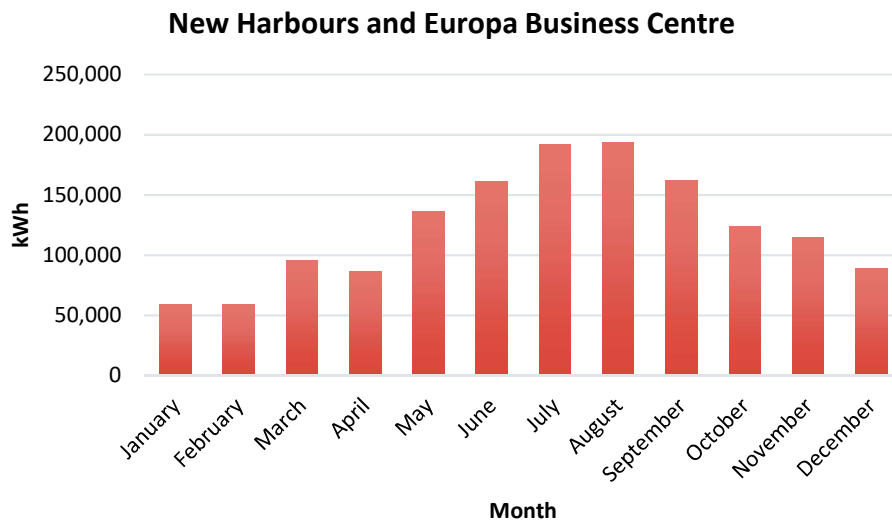
Solar energy produced at St Bernard's Hospital in 2021.

At St Bernard's Hospital, an installed capacity of 26 kW (peak) is in place. In 2021, a total of 13,453 kWh was generated resulting in a saving of £1,749.00.



Solar energy produced at GASA in 2021.

At GASA, an installed capacity of 87.7 kW (peak) is in place. In 2021, a total of 60,421 kWh was generated resulting in savings of £7,855.00.



Solar energy produced at New Harbours in 2021.

The New Harbours site is equipped with an installed capacity of 800 kW (peak), and Europa Business Centre with a 450 kW installed capacity. In 2021, both sites were able to generate a total of 1,474,039 kWh, and result in a savings of £191,625.00.