PLYMOUTH CITY COUNCIL

Subject:	Overview of Air Quality Monitoring in Plymouth
Committee:	Brexit, Infrastructure and Legislative Change Overview and Scrutiny
Date:	5 June 2019
Cabinet Member:	Councillor Dann
CMT Member:	Ruth Harrell (Director of Public Health)
Author:	Nicola Horne, Environmental Health (Environmental Protection) Manager
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Ref:	Your ref. NH/ AQ/2019
Key Decision:	No
Part:	I

Purpose of the report:

The report provides an overview of general air quality in Plymouth, including the current Air Quality Management Area, with particular reference to air quality in the vicinity of the Energy from Waste Site.

Corporate Plan

Clean air contributes to the Corporate Plan supporting a growing City, contributing to a clean and tidy city and a green, sustainable city that cares about the environment.

Implications for Medium Term Financial Plan and Resource Implications: Including finance, human, IT and land

All financial implications are covered within existing MTFP and budget models.

Other Implications: e.g. Child Poverty, Community Safety, Health and Safety and Risk Management:

- None

Equality and Diversity

Has an Equality Impact Assessment been undertaken? No

Recommendations and Reasons for recommended action: Information only

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Alternative options considered and rejected:

Published work / information:

Air Quality Management Area in Plymouth.
http://www.plymouth.gov.uk/sites/default/files/MapOfPlymouthsAQMAArea.pdf
Plymouth and South West Devon Joint Local Plan.
https://www.plymouth.gov.uk/planningandbuildingcontrol/plymouthandsouthwestdevonjointlocalplan
Action Plan and Local Transport Plan.
http://www.plymouth.gov.uk/sites/default/files/LocalTransportPlan20112026.pdf
Clean Air Strategy 2019.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf
MVV Environment Devonport- monitoring data.
https://m.mvv.de/en/mvv_energie_gruppe/mvv_umwelt/beteiligungen/mvv_environment_1/devonport/links_downloads/

Background papers:

Title	Part I	Part II	Exemption Paragraph Number						
			1	2	3	4	5	6	7

Sign off

Fin	djn19.20.12	Leg	32626/ag/23.5.19	Mon Off		HR		Assets		IT		Strat Proc	
Originating SMT Member													
Has the Cabinet Member(s) agreed the contents of the report? Yes													

1. **Summary** The principles of protecting the air we breathe is contained within the Plymouth & South West Devon Joint Local Plan (JLP), as it was previously in the Local Development Framework before that. Since 2014, when the single Air Quality Management Area was put in place, air quality improvements are being observed in all of the areas contained within the AQMA with all but one small area well within recommended levels.

2. Emissions from road transport are by far the greatest cause of air pollution in Plymouth; Plymouth City Council has a balanced transport strategy that seeks to support the objective of cleaner, healthier air for its residents and visitors and significant transport schemes have been carried out and are planned to shift the flows of traffic to reduce exposures. The strategy also has a strong focus on encouraging greater sustainable transport use with more trips undertaken by bus, cycle and foot, alongside reducing the need to travel, and enabling greater use of cleaner fuel vehicles.

3. With the increased national focus on air quality, we have recently carried out a large piece of work, with DEFRA, to validate and analyse all data, include transport flows, current, historic and modelled based on new transport programmes, as well as air quality monitoring. This was to support consideration of a clean air zone (which might have included charging cars for certain areas of the city at certain times). This showed that the actions taken by Plymouth have shown significant results, with schemes currently underway predicted to reduce air pollution even further, and ruled out the need for a clean air zone.

4. On Monday 18th March, Plymouth City Councillors voted unanimously to pass a motion declaring climate emergency, pledging to be carbon neutral by 2030. Obviously there is a considerable overlap between this and air pollution, particularly around the use of sustainable and / or active transport, which has multiple health benefits.

5. **Introduction** Air pollution arises from numerous sources and this report describes the local air pollution monitoring undertaken in Plymouth and a summary of the results.

6. There is a statutory obligation on all local authorities, under the Environment Act 1995 and various regulations to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance occurs, the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

7. Air quality objectives have been determined for key pollutants which the local authority have to assess and these are set down in guidance produced by Department of Environment Food and Rural Affairs (DEFRA). Technical guidance has been issued which local authorities have to follow in their determination of air quality. This considers all local sources of pollution for the air pollutants listed in guidance, and screens potential pollution sources to ensure resources are allocated to the pollutants of concern in an area.

8. Air pollution arises from various sources and is controlled by legislation or national interventions and control by government on fuels and technology for example, and this approach is published in the Governments Clean Air Strategy 2019. Industry regulation of air pollution is by the Environment Agency (EA) or the local authority, dependent on the type of industry, and its impact on the environment, for example, regulation of the Energy from Waste site, is by the Environment Agency, however smaller sites, such as paint spraying

processes or the crematoria for example, are regulated by the local authority. All of these sites operate under an Environmental Permit, to regulate their emissions.

9. Air quality is considered in development decisions that are made by the council and is included in the Plymouth and South West Devon Joint Local Plan. Certain developments may be subject to planning conditions to ensure that air quality impacts are considered appropriately, and mitigated against.

10. An Annual Status Report (ASR) is produced showing the monitoring data for each year compared to the air quality objectives and what measures have been implemented to improve air quality. A summary of this report is available on the Council website for each year. The 2018 monitoring data is due to be reported to the DEFRA at the end of June 2019. A summary of this report will be published following acceptance of the council findings by DEFRA.

11. Plymouth has a single AQMA which was declared in 2014 for nitrogen dioxide, largely due to road traffic emissions. This AQMA includes Exeter Street, Mutley Plain, Stoke Village, Royal Parade and Tavistock Road and their connecting roads. A map of the city wide AQMA can be found on the following link:
http://www.plymouth.gov.uk/sites/default/files/MapOfPlymouthsAQMAArea.pdf

12. Plymouth City Council has produced a joint Air Quality Action Plan (AQAP)/ Transport Plan to implement various schemes to control traffic and pollution levels, which is due for review this year. The document can be found on the following link:
http://www.plymouth.gov.uk/sites/default/files/LocalTransportPlan20112026.pdf

13. **Monitoring.** Plymouth, like many other local authorities, uses two main methods of monitoring air pollution; continuous analysers and diffusion tubes.

Location of continuous analysers	**Pollutants monitored**
City Centre-Armada Way	Nitrogen dioxide Particulates ($PM_{2.5}$and PM_{10})
Royal Parade	Nitrogen dioxide
Mutley Plain	Nitrogen dioxide
Tavistock Road	Nitrogen dioxide
Moor Lane	Particulates ($PM_{2.5}$ and PM_{10})

14. In 2018, diffusion tubes were located in 24 locations, meeting the criteria set out in government guidance to represent the areas of exposure to the public, for example where residential properties are close to busy roads. Other tubes are located for transport purposes to assess the impact of new or planned road schemes. Maps of the locations of diffusion tubes are included in Appendix 1, including those located for transport purposes.

15. **Results**. Air quality has been improving in most areas across the city. Certain improvements have been made nationally as older vehicles are replaced with newer less polluting vehicles, however improvements have been made with transport improvements such as the East End transport schemes. Further national improvements are expected from increased availability of electric vehicles. The ASR and AQAP details some of the improvements made on a year by year basis.

16. Nitrogen dioxide results from the AQMA are shown in the graphs in Appendix 1 for each of the sites in the AQMA. Monitoring over the last 3 years has indicated that the air quality objective has been met for nitrogen dioxide in Exeter Street, Tavistock Road, Stoke Village and Royal Parade. Mutley Plain is the only area within the AQMA that has concentrations of nitrogen dioxide slightly above the air quality objectives, although levels of nitrogen dioxide have been improving in this area, along with other sites in recent years.

17. Particulate results (PM_{10} and $PM_{2.5}$) are shown for both the city centre location (part of the DEFRA network), and for the Moor Lane analyser, which is operated by MVV. A graph of these results is shown in Appendix 1. These results are below the air quality objective in both locations. Whist there is an air quality objective for PM_{10}, there is no air quality objective set by Government for $PM_{2.5}$. This is for reporting purposes only and not many cities in the UK report on $PM_{2.5}$ levels.

18. **Environment Agency Assessment of Operations at the Devonport Energy from Waste CHP** The EA are unable to attend the scrutiny meeting but were asked to provide an update on their regulation of MVV Devonport Ltd. MVV Devonport Ltd. were issued with an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2010 (as amended) in 2012. The EA regulate the operations undertaken by the facility and have done so since the completion of construction and commissioning.

19. The EA report that the site have performed well with no concerns regarding emissions to air that may have had an impact on local air quality. The permit lays down emission limits for a variety of pollutants and a number of these are monitored continuously, these being oxides of nitrogen, sulphur dioxide, particulates (dust), carbon monoxide, hydrogen chloride and total organic carbon. The results of this monitoring are submitted by MVV to the Environment Agency on a monthly basis. Results are published on the MVV website and on the public register.

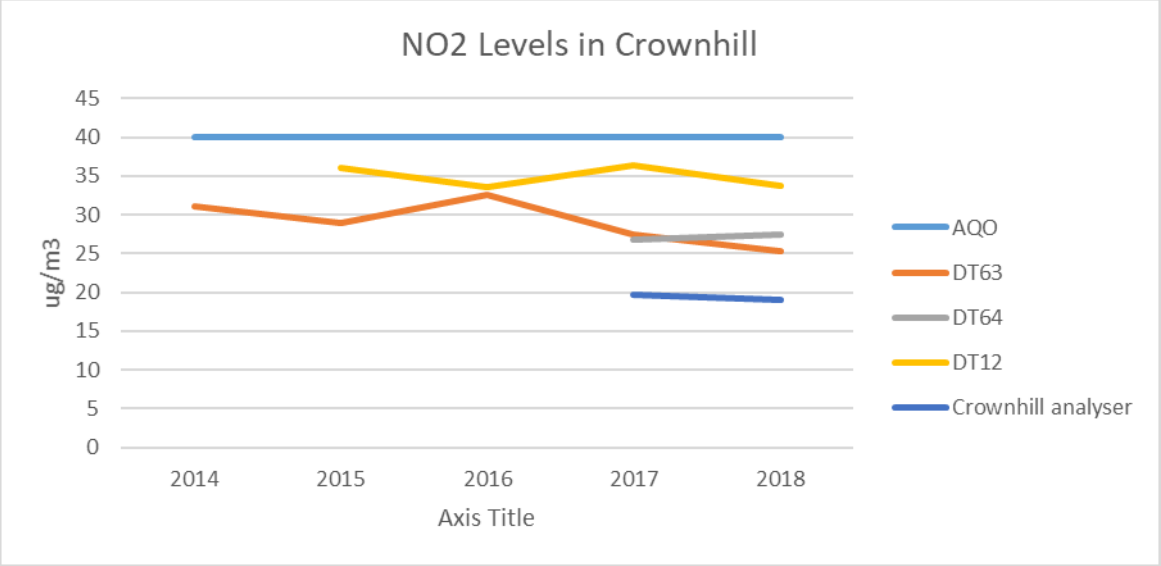
20. When the permit was first determined an assessment was undertaken to establish the potential impact of air emissions. This was based on a worst case scenario of the plant operating continuously at its permit emission limit values and taking background levels into consideration. This assessment concluded that the EU Environmental Quality Standards for the various pollutants would not be exceeded. An extract of the resulting permit decision document is included in Appendix 2 regarding the assessment of oxides of nitrogen and particulate matter, specifically PM_{10} and $PM_{2.5}$.

21. The EA report that as the site operate within their emission limit values, then the EA can be confident that the site will not have a detrimental effect on air quality. All monitoring results, copies of the permit and permit decision document are held on the Environment Agency's public registers.

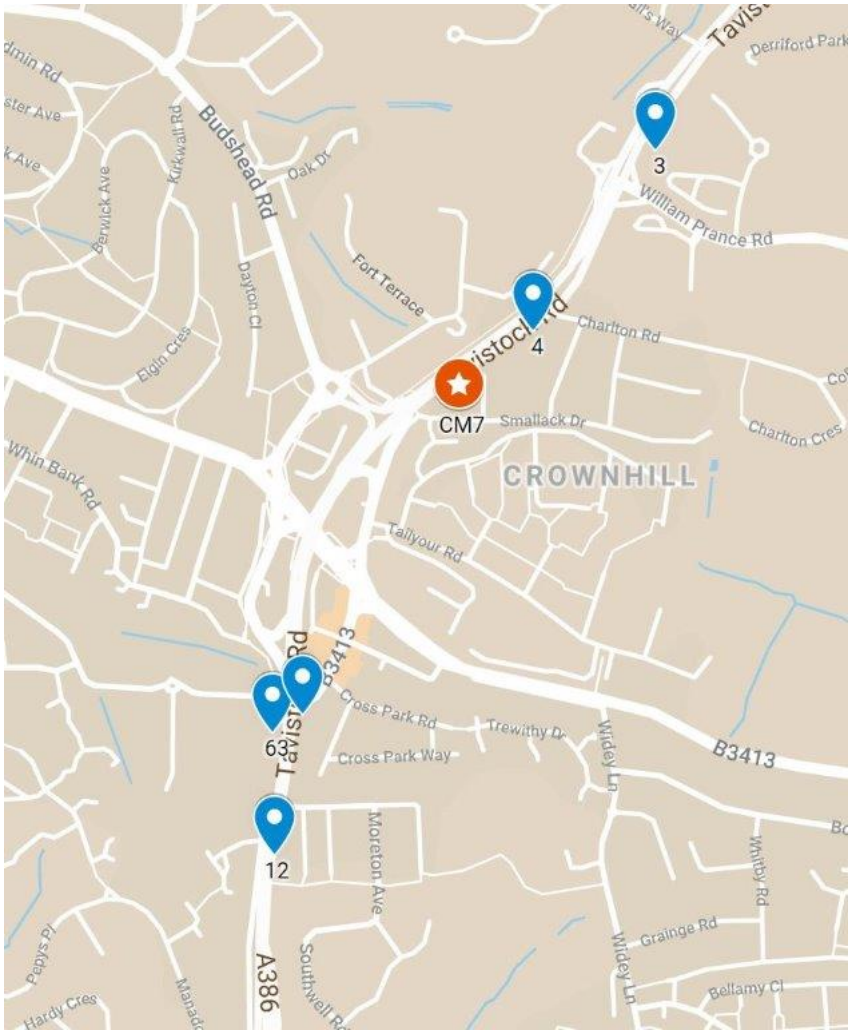
22. **MVV Monitoring Information**. MVV undertake air quality monitoring of the potential impact of their site, required as part of the Environmental Permit and planning permission conditions. This data is published on the MVV website on the following link, for stack emissions, diffusion tube monitoring in the community and quarterly reports for the continuous analysers at Weston Mill Junction and Moor Lane. https://m.mvv.de/en/mvv_energie_gruppe/mvv_umwelt/beteiligungen/mvv_environment_1/devonport/links_downloads/

23. The Council have reviewed the MVV monitoring data and the results are well within the air quality objectives for PM_{10} and nitrogen dioxide with no exceedance of the air quality objectives.

Appendix 1
Results of air quality monitoring in Crownhill/ Tavistock Road 2014 to 2018 for nitrogen dioxide compared to the Air Quality Objective (AQO).

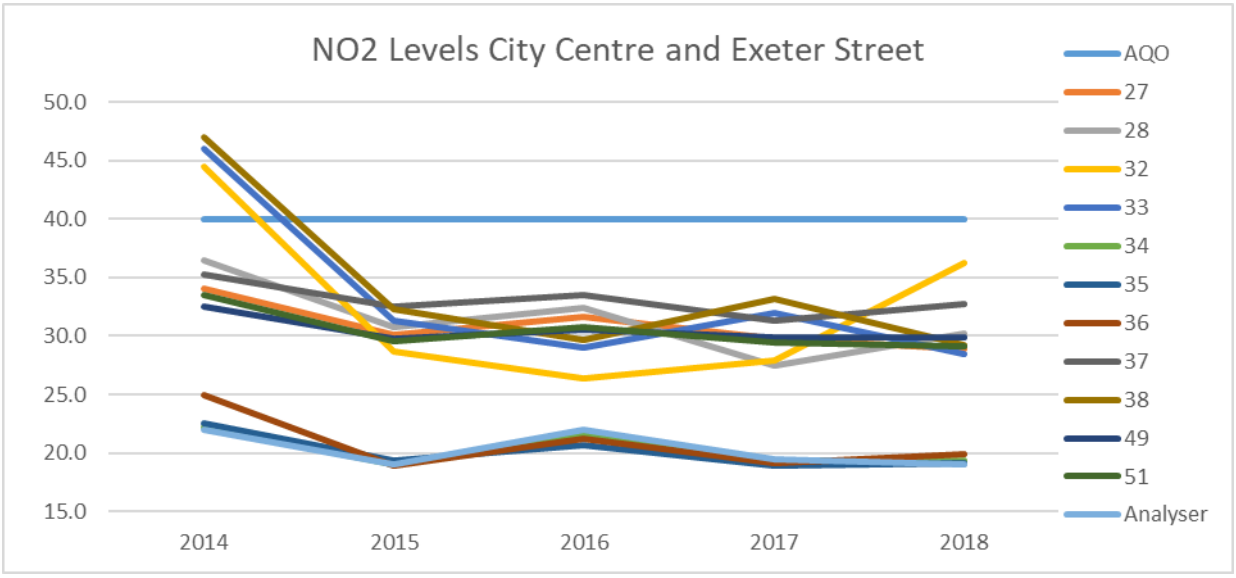


Map of Tavistock Road diffusion tube locations 2018



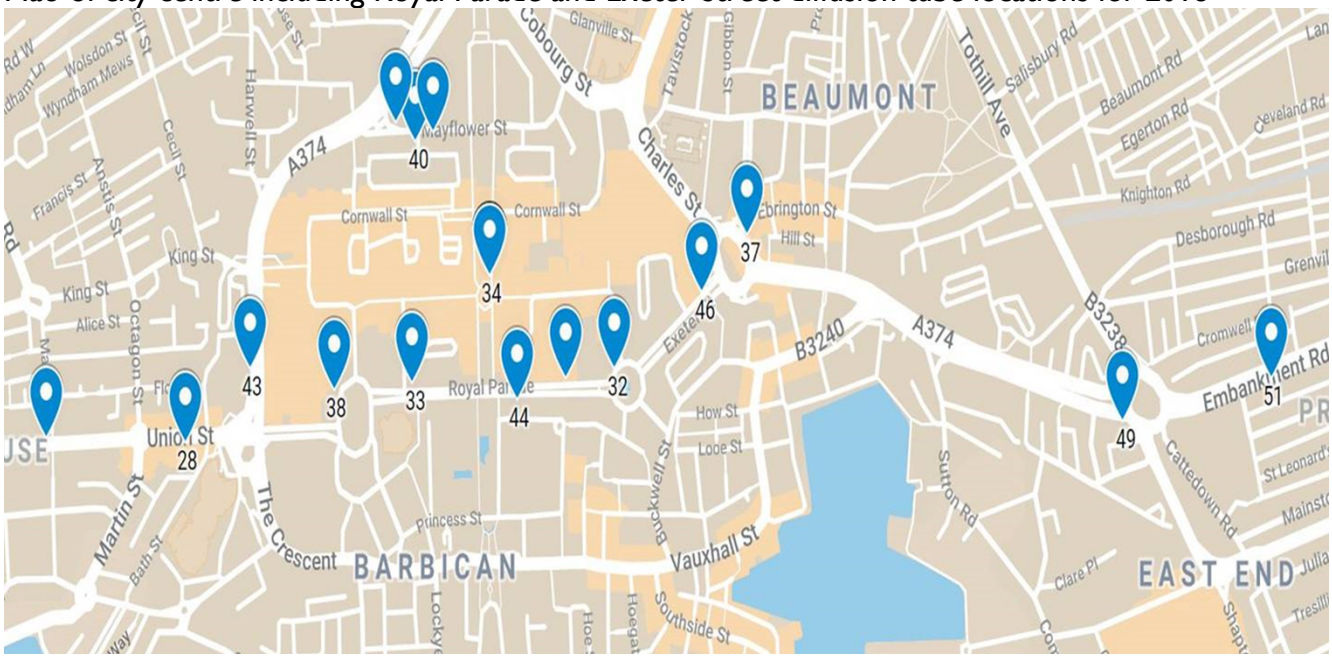
- Unlabelled tube is tube DT64.

Results of air quality monitoring in Royal Parade, 2014 to 2018 for nitrogen dioxide compared to the Air Quality Objective (AQO).

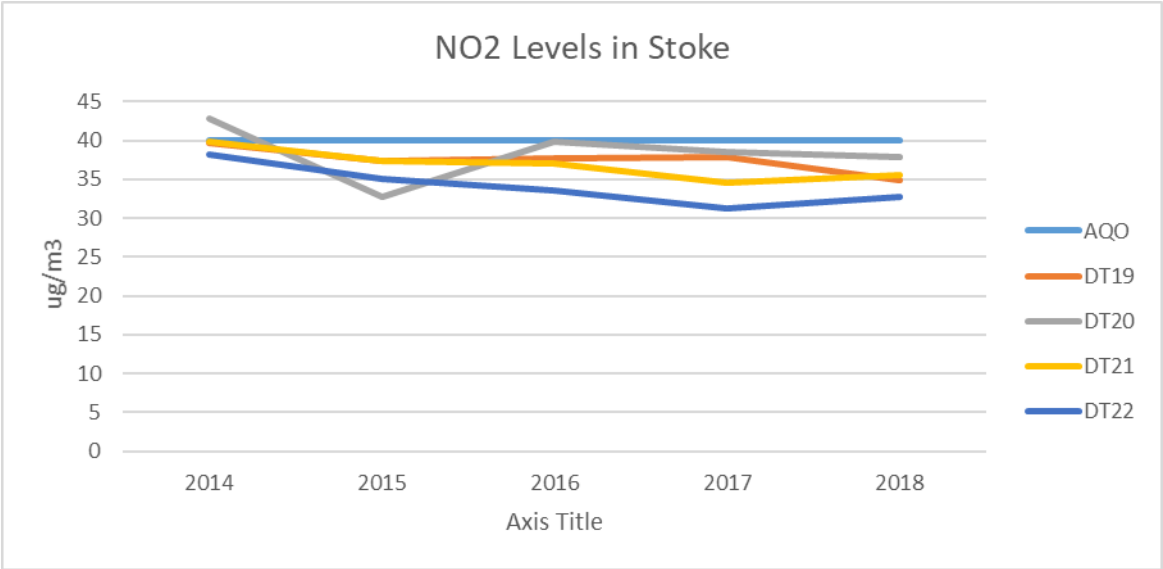


- Analyser is located in Armada Way. There are three tubes co-located on the analyser, showing a very good correlation. (tubes 34, 35 and 36 and analyser).

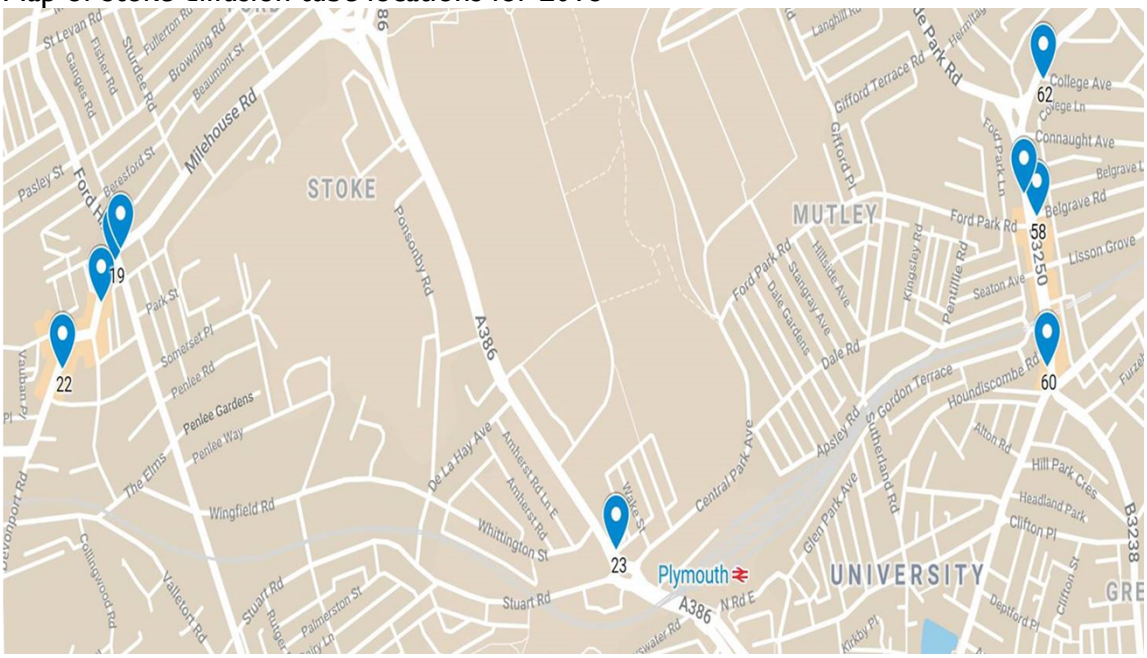
Mao of city centre including Royal Parade and Exeter Street diffusion tube locations for 2018



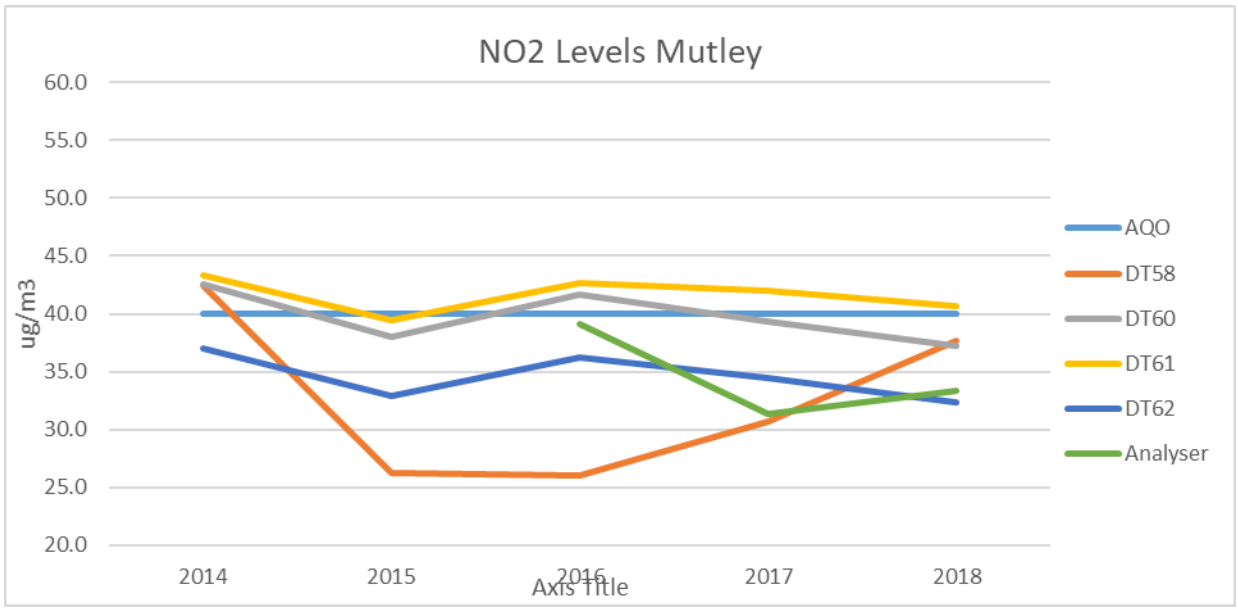
Results of air quality monitoring in Stoke Village, 2014 to 2018 for nitrogen dioxide compared to the Air Quality Objective (AQO).



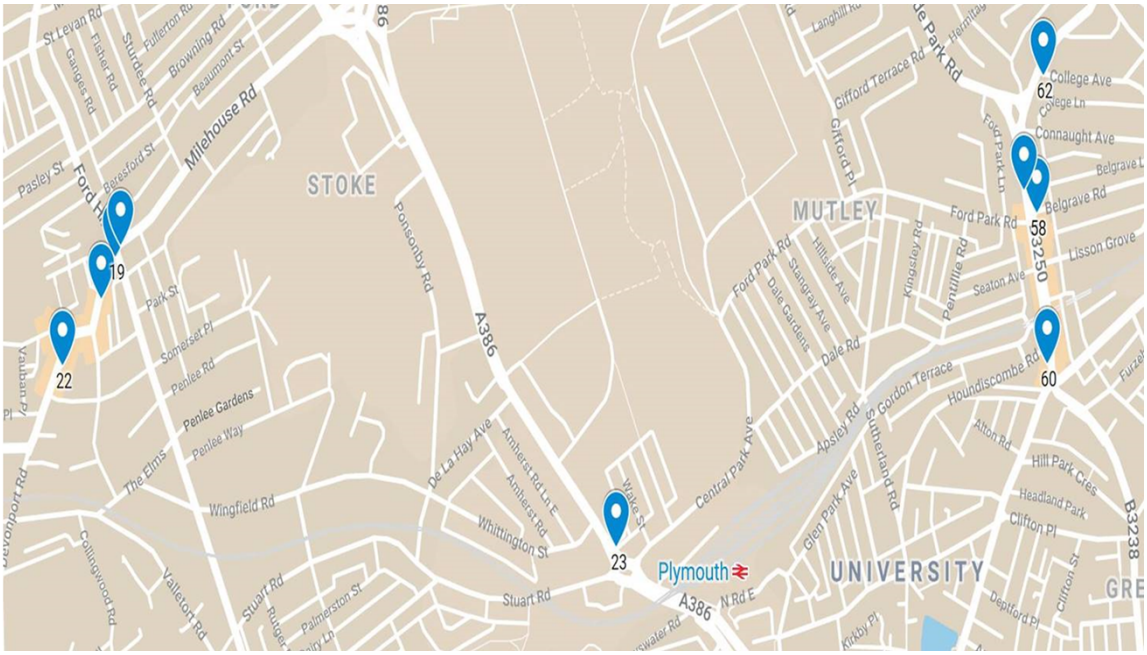
Map of Stoke diffusion tube locations for 2018



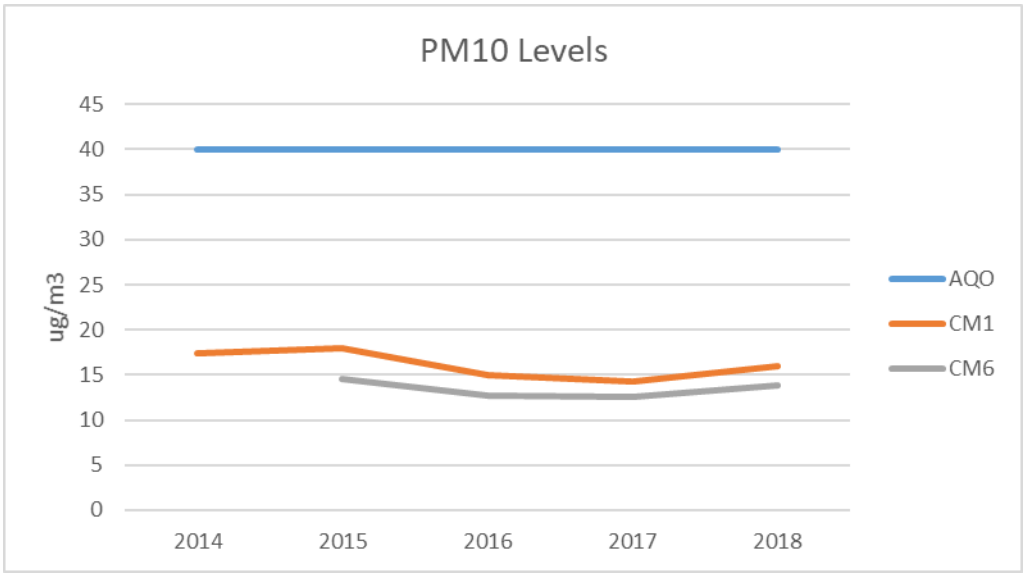
Results of air quality monitoring in Mutley Plain, 2014 to 2018 for nitrogen dioxide compared to the Air Quality Objective (AQO).

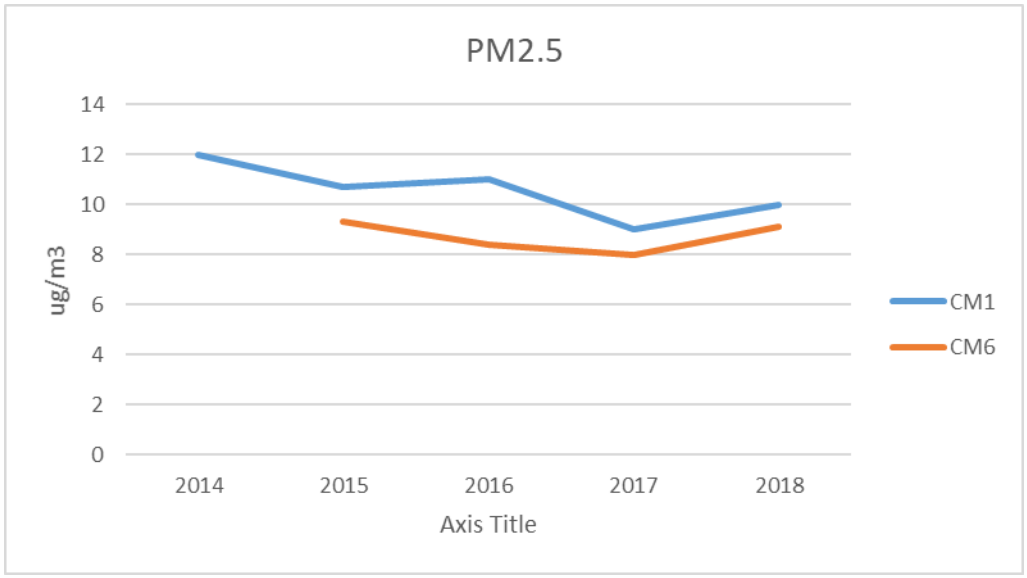


Map of Mutley Plain diffusion tube locations 2018



Results for particulate monitoring for PM_{10} and $PM_{2.5}$ for City Centre (CM1) and Moor Lane (CM6) compared to the Air Quality Objective (AQO).





*There is no air quality objective set for $PM_{2.5}$, however the World Health Organisation suggest 10ug/m3 and an annual mean figure. Limited numbers of Councils report on $PM_{2.5}$.

Appendix 2
Information Provided by the Environment Agency in relation to process contribution from the MVV Environment Devonport.

Determination of an Application for an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2010

Decision document recording our decision-making process

The Permit Number is:	EPR/WP3833FT
The Applicant / Operator is:	MVV Environment Devonport Limited
The Installation is located at:	Devonport Energy from Waste CHP, North Yard, Devonport Dockyard, Plymouth, PL5

What this document is about

This is a decision document, which accompanies a permit.

It explains how we have considered the Applicant's Application, and why we have included the specific conditions in the draft permit that we are proposing to issue to the Applicant. It is our record of our decision-making process, to show how we have taken into account all relevant factors in reaching our position. Unless the document explains otherwise, we have accepted the Applicant's proposals.

A lot of technical terms and acronyms are inevitable in a document of this nature: we provide a glossary of acronyms near the front of the document, for ease of reference.

Preliminary information and use of terms

We gave the application the reference number EPR/WP3833FT/A001. We refer to the application as "the **Application**" in this document in order to be consistent. The permit reference number is EPR/WP3833FT. We refer to the proposed permit as "the **Permit**" in this document. The Application was duly made on 7 June 2011.

The Applicant is MVV Environment Devonport Limited. We refer to MVV Environment Devonport Limited as "the **Applicant**" in this document. Where we are talking about what will happen after the Permit is granted, we call MVV Environment Devonport Limited "the **Operator**".

MVV Environment Devonport Limited's proposed facility is located at the North Yard of Devonport Dockyard in Plymouth. We refer to this as "the **Installation**" in this document.
MVV

5.2.1 Assessment of emissions of Nitrogen Oxides

The predicted peak ground level impact on ambient NO_2 levels is shown in the tables below.

Pollutant	Max Conc at source (mg/m^3)	Emission Rate (g/s)	Emission Rate (tpa)
NO_2 (long term)	200	11.2	352.3
NO_2 (short term)	400	22.4	-

Pollutant	EQS/EAL	Background	Process Contribution		Predicted Environmental Concentration	
	µg/m^3	µg/m^3	µg/m^3	% of EAL	µg/m^3	% of EAL
NO_2	40 (1)	15.3	1.8	**4.5**	17.1	**43**
	200 (2)		22.2	**11.1**	52.8 (3)	**26**

Note 1: Annual Mean
Note 2: 99.79th %ile of 1-hour means
Note 3: Short term PEC = PC + (2 x background)

The impact on air quality from NO_2 emissions has been assessed against the EUEQS of 40 µg/m^3 as a long term annual average and a short term hourly average of 200 µg/m^3. The model assumes a 70% NO_x to NO_2 conversion for the long term and 35% for the short term assessment in line with Environment Agency guidance.

The above table shows that the peak long term PC is greater than 1% of the EUEQS and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the EQS being exceeded. The peak short term PC is marginally above the level we would consider insignificant (>10% of the EUEQS). However it is not expected to result in the EQS being exceeded.

Impact on Air Quality Management Areas (AQMAs)

Plymouth City Council has declared two AQMAs with respect to NO_2. These are Mutley Plain and Exeter Street. Both are located in the city centre approximately 5 Km to the south east of the proposed installation. Plymouth City Council are reported by the Applicant to be considering three new NO_2 AQMAs at Tavistock Road, Stoke Village and Royal Parade, with the possibility of a city wide AQMA.

Cornwall Council is in the process of declaring an AQMA for NO_2 at Tideford. The geographic extent of this AQMA is yet to be decided. Tideford is approximately 10Km to the west of the proposed installation.

From the Applicants model, the process contribution at all points within each of the AQMAs will be well below 0.4 µg/m^3 (or 1% of the EUEQS) and can therefore be considered insignificant.

Overall, whilst NO_x emissions cannot be screened out as insignificant, the Applicant's modelling shows that the installation is unlikely to result in a breach of the EUEQS. The Applicant is required to prevent, minimise and control NO_x emissions using the best available techniques; this is considered further in Section 6. We are satisfied that NO_x emissions will not result in significant pollution.

5.2.2 Assessment of emissions of PM_{10} and $PM_{2.5}$

The predicted peak ground level impact on ambient particulate levels is shown in the tables below.

Pollutant	Max Conc at source (mg/m^3)	Emission Rate (g/s)	Emission Rate (tpa)

PM_{10}	10	0.559	17.6
PM_{10} (short term)	30	1.677	-
$PM_{2.5}$	10	0.559	17.6

Pollutant	**EQS/EAL**	**Background**	**Process Contribution**		**Predicted Environmental Concentration**	
	µg/m³	**µg/m³**	**µg/m³**	**% of EAL**	**µg/m³**	**% of EAL**
PM_{10}	40 (1)	13.3	0.1	**0.25**	13.4	**34**
	50 (2)		1.2	**2.4**	27.9 (3)	**56**
$PM_{2.5}$	25 (1)	8.6	0.1	**0.4**	8.7	**35**

Note 1: Annual Mean
Note 2: 90.41st %ile of 24-hour means
Note 3: Short term PEC = PC + (2 x background)

The impact on air quality from particulate emissions has been assessed against the EQS for PM_{10} (particles of 10 microns and smaller) and $PM_{2.5}$ (particles of 2.5 microns and smaller). For PM_{10}, the EUEQS are a long term annual average of 40 µg/m³ and a short term daily average of 50 µg/m³. For $PM_{2.5}$ the EUEQS of 25 µg/m³ as a long-term annual average to be achieved by 2010 as a Target Value and by 2015 as a Limit Value has been used.

The Applicant's predicted impact of the Installation against these EQSs is shown in the table above. The assessment assumes that **all** particulate emissions are present as PM_{10} for the PM_{10} assessment that **all** particulate emissions are present and as $PM_{2.5}$ for the $PM_{2.5}$ assessment.

The above assessment is considered to represent a worst case assessment in that: -

- It assumes that the plant emits particulates continuously at the WID limit for total dust, whereas actual emissions from similar plant are normally in the range 1 to 5 mg/m³.
- It assumes all particulates emitted are below either 10 microns (PM_{10}) or 2.5 microns ($PM_{2.5}$), when some are expected to be larger.

We have reviewed the Applicant's particulate matter impact assessment and are satisfied in the robustness of the Applicant's conclusions.

The above assessment shows that the predicted process contribution for emissions of PM_{10} is below 1% of the long term EQS and below 10% of the short term EQS and so can be considered insignificant. Therefore, generally, we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

The above assessment also shows that the predicted process contribution for emissions of $PM_{2.5}$ is also below 1% of the Environmental Quality Objective. Therefore the Environment Agency concludes that particulate emissions from the installation, including emissions of PM_{10} or $PM_{2.5}$, will not give rise to significant pollution.