Update on the DEFRA Air Quality Grant

Committee considering report:	Joint Public Protection Committee
Date of Committee:	12 June 2023
Chair of Committee:	To be appointed at the meeting
Date JMB agreed report:	22 May 2023
Report Author:	Suzanne McLaughlin
Forward Plan Ref:	JPPC4308

Purpose of the Report

To provide Members with an update on the progress with the DEFRA Grant, including the Particulate Matter (PM2.5) at schools project.

Recommendation

The Committee:

1.1 **NOTES** the progress on the measures to improve air quality through the grant funded particulate programme.

1.2 **ENDORSES** the ongoing work in this area and the drive to encourage behaviour change.

Implications and Impact Assessment

Implication	Commentary
Financial:	Work relating to Air Quality monitoring and reporting is funded from the general revenue budget allocated to the Joint Public Protection Committee. A number of proposals in the Action Plans continue to require additional funding to implement whilst others are relatively low cost and are covered from PPP revenue budget. The programme described in this particular report was funded by a Defra Grant issued for Bracknell Forest, West Berkshire and Wokingham for a three authority project following a bid by the PPP on behalf of the then partner authorities.
Human Resource:	Staff who conduct this work are a shared resource under the Inter Authority Agreement (IAA). The Team also undertake Air Quality work for Wokingham BC under the revised inter-authority agreement between Wokingham and PPP. One benefit of the shared service is the ability to have staff that specialise in areas such as this and the service is fortunate to have a number of officers with significant expertise on environmental matters generally and air quality specifically.

	The Grant from DEFRA has meant that the authority has been able to appoint an Air Quality Officer on a fixed term contract until September 2023 to support the anti-idling campaign. The post holder left WBC in April 2023 and some of the work is continued using the temporary staff and the remainder will be completed in-house.			
Legal:	Under the Local Air Quality Management (LAQM) system local authorities are legally required to assess air quality in their area and designate Air Quality Management Areas (AQMAs) if improvements are necessary. Where an AQMA is designated, local authorities are required to produce an Air Quality Action Plan (AQAP) describing the pollution reduction measures it will put in place.			
Risk Management:	It is a legal requirement under the Environment Act 2005 to report on our pollution levels. Failure to comply with our statutory obligations could present the risk of challenge to the PPP partner authorities.			
Property:	There are no direct property implications arising from this report.			
Policy:	The Inter-Authority Agreement (IAA) identified Environmental Protection as one of the five Strategic Priorities for the Joint Public Protection Committee. Under this heading the Committee in turn identified air quality as a priority for 2021/22 and going into 2022/23 and 2023/24. West Berkshire has declared a climate emergency. They have embedded Air Quality improvements into their Environment Strategy and Climate Emergency Action Plans. Bracknell Forest Council's Climate Change strategy was completed and published in January 2021 and have a target of net carbon zero by 2050.			
	Positive	**Neutral**	**Negative**	**Commentary**
Equalities Impact:				
A Are there any aspects of the proposed decision, including how it is delivered or accessed, that could impact on inequality?		x		No specific groups are affected by the contents of the proposals as there are no decisions being made. Air quality can be particularly harmful to sensitive receptors (the young, elderly, pregnant and those suffering ill health). Consideration to all these matters are given in this report and appendices and / or the national clean air strategy.

B Will the proposed decision have an impact upon the lives of people with protected characteristics, including employees and service users?		x		No specific groups are affected by the contents of the proposals as there are no decisions being made. Air quality can be particularly harmful to sensitive receptors (the young, elderly, pregnant and those suffering ill health). Consideration to all these matters are given in this report and appendices and / or the national clean air strategy.
Environmental Impact:	x			Under the Local Air Quality Management (LAQM) system local authorities are legally required to assess air quality in their area and designate Air Quality Management Areas (AQMAs) if improvements are necessary. Where an AQMA is designated, local authorities are required to produce an Air Quality Action Plan (AQAP) describing the pollution reduction measures it will put in place. These reports identify actions to assist the Local Authorities in dealing with reducing pollution and are therefore designed to have a positive impact on the environment.
Health Impact:	x			Although there has been a reduction in air pollution since the 1970s, poor air quality is still the largest environmental risk to public health in the UK. It shortens lives and reduces quality of life, particularly amongst the most vulnerable, the young and old, and those living with health conditions. Ongoing monitoring and where appropriate the creation of action plans is designed to improve the quality of lives of our residents. Carrying out specific actions through these projects enables us to have a better understanding of the levels of pollutant(s) across the Local Authority areas and change behaviour to reduce exposure.
ICT or Digital Services Impact:		x		None
PPP Priorities :				The report will impact on the following PPP Priorities: 1. Environmental Protection 2. Impact of Nuisance on Residents and Communities 3. Improved Air Quality
Data Impact:		x		None

Consultation and Engagement:	No consultation is required.
Other Options Considered:	None – but the findings will be included in the Annual Status Reports, a statutory requirement to be submitted to DEFRA annually.

Executive Summary

1.3 The PPP was successful in being awarded grant funding to carry out PM2.5 monitoring and anti-idling campaign projects. This update details the work and results to date as the work is still ongoing.

1.4 This report sets out the work conducted so far in respect of particulate measurement as well as the work done to encourage behaviour change with respect to vehicle idling.

Introduction / background

1.5 Local Air Quality Management (LAQM) is required under the Environment Act 1995, as amended by the 2021 Act. Technical Guidance was updated in 2022 which has shifted towards evidence based action planning for benefits of public health and wellbeing. Policy Guidance, again updated in 2022, is designed to assist Local Authorities to improve air quality using available levers, including planning, public health and transport responsibilities.

1.6 Air Quality Management Areas (AQMA) are geographical areas declared, by Legal Order, where there is an exceedance of the limit value (as measured in e.g. micrograms per cubic meter) of one or more of the pollutions (e.g. nitrogen dioxide) for one or more of the exposure periods (e.g. 1 hour or annual) of the air quality objectives as scheduled Air Quality Standards Regulations 2010. There are currently two AQMAs in West Berkshire, two in Bracknell Forest and three in Wokingham borough.

1.7 Air Quality Action Plans (AQAP) comprise of actions to improve air quality, a whole Local Authority responsibility. These Plans outline local measures to improve pollution levels within the AQMAs and more widely across the district/borough. The action plan is integrated with the delivery of the adopted Local Transport Plan (LTP) to improve local air quality and climate change, through joint working with the Council's Environmental Health, Transport Policy, Highways, Planning and Public Health Service areas.

1.8 Annual Status Reports (ASRs) are submitted every year for a calendar year of monitoring data and updates on actions undertaken. These are submitted to DEFRA for approval. They are used by third parties in planning applications, as well as in-house decisions by Highways and Transport Planning colleagues. In addition the increased significance is recognised as identified actions are now intrinsically linked with Climate Emergency Plans and Environmental Strategies.

1.9 Particulate Matter is a term used to describe the mixture of solid particles and liquid droplets in the air. They can be human made or naturally occurring, e.g. dust, ash, sea spray. Particulate matter is emitted during combustion of solid and liquid fuels, such as power generation, domestic heating and in vehicle engines. Sources under the control

of the local authority or national government include vehicle exhaust, brake and tyre wear and use of coal heating or biomass boilers for domestic or industrial purposes. As there have been marked reductions in vehicle exhaust emissions over the last ten years, the contribution of non-exhaust sources (tyre and brakes) is now rising in importance. The composition of particulate matter depends on many factors including emission source, weather conditions and local and regional contributions. DEFRA data indicates that natural or regional secondary sources make up the vast proportions of PM2.5 across our areas, with the primary emissions from sources such as industry, road vehicles (exhaust and non-exhaust), off-road transport, and domestic boilers.

1.10 Particulate matter (PM) varies in size (the width) of the particle. PM2.5, also known as fine particulate matter, means the mass per cubic metre of air of particles with a size less than 2.5 micrometres (µm) (i.e. 1 400th of a mm). As they are so small they are able to travel deep into the respiratory tract reaching the lungs. The health risk of short-term exposure (over hours or days) can lead to a range of health impacts including lung function, eye nose and throat irritation, coughing, wheezing and shortness of breath, exacerbation of asthma, increases in respiratory and cardiovascular hospital admissions and mortality.

DEFRA Grant application

2.1 DEFRA Air Quality grant funding scheme opportunities are annual. There are certain criteria to enable eligibility to apply, which includes having an AQMA declared for exceedances of nitrogen dioxide with an AQAP in date with measures linked, and the ASR has been submitted on time and findings approved. There are two types available to apply for, one for a single Local Authority (LA) and the second a joint application by one LA on behalf of a group of LAs.

2.2 In 2020/21 we were successful in bidding as a three authority project proposal. The proposal was put forward by WBC on behalf of the three LAs then in the PPP as they would ultimately hold accountability for budget and reporting in the event of the success we received.

2.3 The grant awarded was for £259,000 for the projects of creating an anti-idling campaign, measuring PM2.5 at the schools located near/within the AQMAs and looking at behaviour change of our residents with the aim of reducing exposure of children at school and raising awareness of parents /carers and children and the wider community. By mid-2021 an Air Quality Officer was appointed to lead on the delivery of the projects.

PM2.5 project

3.1 Air quality consultants, were appointed to monitor PM2.5 and PM10 and weather at or close to 42 selected schools that were within or close to the AQMAs. Monitoring at the schools, 14 in each LA area, took place between February 2022 to February 2023 for a minimum of three months to include term time and holiday periods. This provided a snap shot of the levels around schools using a low-cost air quality sensor unit (Vortex) providing real-time measurements at five minute intervals. As the data was not ratified nor calibrated againast a reference equivallent monitor, the data provided an indicative measurement. The monitors were paired with weather sensors located close by to continuouslty measure parameters including wind speed and direction, temperature and rainfall. The air quality monitoring equipment was attached to a lamp post or street light and the weather station positions close by but on another lamp post or street light.

3.2 The data has not been annualised to represent an annual mean and therefore the results are only indicative. However, the period means were all below the relevant air quality objectives. All the schools were within the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 for PM2.5 (i.e. the annual mean should not exceed 25 µg/m³ and the interim target of 12 µg/m³ to be met by end 2027 and long term target of 10 µg/m³ by 2040.)

3.3 Hourly, daily and weekly results were analysed for temporal distribution and also plotted to compare the difference between school term time and holiday. Lower concentrations seen in the daytime were due to warmer temperature allowing PM to disperse; the nighttime cooler temperatures reduced the atmospheric boundary layer and increased stability acting to trap PM closer to the ground. The concentrations did vary, weather clearly influenced concentrations such as rainfall acts to disperse and deplete pollution more readily. The winter higher concentrations from the continent were seen as opposed to the cleaner maritime air from the Atlantic. Patterns in road taffic flow has an effect but is not as signifcant as weather conditions. The morning rush hour increase in concentration was evident, as were higher concentrations recorded around 9am and then again around 4pm coinciding with the end of the school day. Concentrations were seen to be higher in the middle of the week and then at the end of the week and weekends, these are due to changes in road traffic and commercial/industrial activity in the post-covid hybrid working pattern. Overall lower concentrations were noted in holiday periods.

3.4 The schools have all been sent their site-specific Particulate Monitoring Report and Action Plan. This set out the details of the monitoring, the results and detailed analysis, a number of actions to further investigate the sources of pollution and to target air quality improvements for children at the school and the surrounding area. It is recommended that an audit of sources around the school is considered before considering the most appropriate actions to take forward. The audit could include looking at the age of boilers and where flues are positioned; considering the location of the playground to busy roads and does any screening exist; school travel plans and accessibility for cycling/scooting to school; review of vehicle engine idling or traffic queuing outside the school. In addition a number of mitigation measures were identified, divided into generic measures which could be applicable across the district/borough and those more specific to individual schools. For each measure an approximate timescale and cost was given based on the following criteria: potential air quality benefits; cost; deliverability; and wider benefits (e.g. improved safety, child health and promotion of sustainable transport). See Appendix A for an example of a generic and specific mitigation measure table.

3.5 Whilst the study did not identify any significant health risks associated with exposure to PM2.5 recommendations have been made to reduce the levels of PM2.5 in the air wherever possible.

Behavioural Change – Anti-idling work with School Children

4.1 A Bumper Sticker competition was launched in 2021 for all primary schools across the three LAs to design a sticker for a rear car window, encouraging the driver behind to switch off their engine when they are idling unnecessarily. A total 348 entries were received and the winner was voted by participating schools and the PPP Environmental Quality team. The winning design, as shown in Appendix B came from Ascot Heath Primary School in Bracknell Forest. The stickers have been distributed to local schools, parish councils, libraries, and any other organisation/individual who has expressed an

interest in receiving a sticker. Publicity of the winner and local councillors helped to further broadcast our anti-idling message project.

Behavioural Change - Anti idling campaign

5.1 Specialists were commissioned to deliver a project with the overall purpose of improving air quality through reducing idling within the three LA areas.

5.2 They carried out a study which aimed to look at all locations where idling may occur, including stationary traffic due to congestion/traffic lights and those locations where people may leave their engine running whilst waiting (e.g. school collection, taxi ranks etc.). This involved: a baseline review of air quality within the three LAs, where idling currently occurred and where reducing idling would be of greatest benefit: a literature review, of industry and academic papers on experiments and programs to reduce idling; behavioural insights, including a workshop with key stakeholders to understand local knowledge and behaviours, and a survey to cover drivers in the south east to understand why people might idle. The report concluded with location types to be considered (including schools, taxi ranks, railway/canal crossings), the various types of interventions, and suggested messaging.

5.3 At these locations a team enumerators took baseline numbers of idling, to obtain a standard level of idling to measure any interventions against. These locations are to be revisited to judge the efficacy of the interventions.

5.4 Interventions were created for temporary signs designed as an education campaign for schools. The posters were altered to meet each LA requirements. They were installed by the first week in February 2023 for at least three months. See Appendix C for a selection of designs.

5.5 The delivery of an air quality engagement programme with the 42 schools from the PM2.5 project commenced in March 2023. The engagement sessions will cover the overarching topic of air quality but will build on previous initiatives including the PM2.5 monitoring that has taken place at the schools within the study area and anti-idling review, associated interventions and surveys. The delivery will take place in the current school term. As our Air Quality Officer has left PPP this work is being carried by agents on our behalf, and using their previous knowledge of schools' engagement they have offered a flexible approach with a range by offering an assembly, lessons, toolkit and associated materials/handouts, all tailored to the age range of the audience and where possible tied to relevant curriculum topics. To date uptake from eight schools has been confirmed and the first visits will take place at the end of May and the rest by the end of July. Invitations to other schools was extended.

5.6 In addition this work will be carried out to coincide with Clean Air Day (16th June).

Behavioural Change - (Nitrogen Dioxide) NO2 Biggest Loser

6.1 This project is to assess the effect of the anti-idling campaigns by measuring the nitrogen dioxide levels, using triplicate passive diffusion tubes, levels over a two year period. This monitoring is taking place at the same 42 schools where the PM2.5 monitoring took place.

6.2 The monitoring will continue to the end of 2023 and then the data can be analysed. The school with the greatest reduction in NO2 levels will be awarded a prize, which will be to continue to encourage active travel to school such as a scooter or bicycle shed.

DEFRA Reporting

7.1 The requirements of the grant are that PPP submits a quarterly RAG return on our progress. The latest RAG report can be found at Appendix D to this report.

Concluding Observations

8.1 As stated in the introduction, clean air and air quality is one of the foremost environmental issues of our time. This project has allowed us to establish levels locally whilst at the same time working with schools, children and the community to bring about behaviour change. We have also worked with internal partners such as Civil Enforcement Officers on a co-ordinated approach. Going forward the monitoring and reporting on particulates will be a duty on local authorities. This programme has allowed us to develop our collective strategy ahead of the duty coming into force.

8.2 It is really positive that the PM2.5 results, although indicative, are within the objective levels, however we must not be complacent and continue to monitor pollution levels as well as be proactive in behavioural change.

8.3 We will report back to the Committee on the matter of particulate monitoring and our new duties in due course.

Appendices

1.1 Appendix A – PM2.5 monitoring report – generic mitigation and specific measures

1.2 Appendix B – Bumper sticker

1.3 Appendix C – Selection of anti-idling signs

1.4 Appendix D – Latest RAG Rating

Background Papers:

1.1 None

Subject to Call-In:

Yes: ☐ No: ☒

Report is to note only ☒

Wards affected: All Ward

Officer details:

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Appendix A

Generic Mitigation Measures

Area	Mitigation Measure	AQ Benefits	Cost	Deliverability	Wider Benefits
School Buildings	Renew any aging boilers and convert to low emission boilers or use of ground source heat pumps. Ensure flues are not positioned in school playgrounds and are at a height.	M	H	M	Reduced operating costs
	Install mechanical air filtration systems in classrooms or regularly change filters in existing systems	L	H	M	Improved learning environment
School Grounds	Keep school fencing, barriers and wall clean using wet methods to remove dust and particulates and minimise dispersion	L	L	S	Improved visual amenity
	Ensure equipment is readily available on school to clean any dust, as soon as reasonably practicable after the event using wet cleaning methods.	L	L	S	Improved visual amenity
Other sources	Produce a School Logistics Plan to manage the sustainable delivery of goods and materials to school by consolidated deliveries, changing time of day or use of low emission vehicle.	M	M	M	Noise reductions, promotion of sustainable transport
	Reuse and recycle waste to reduce dust from waste materials	L	L	S	Reduced operating costs

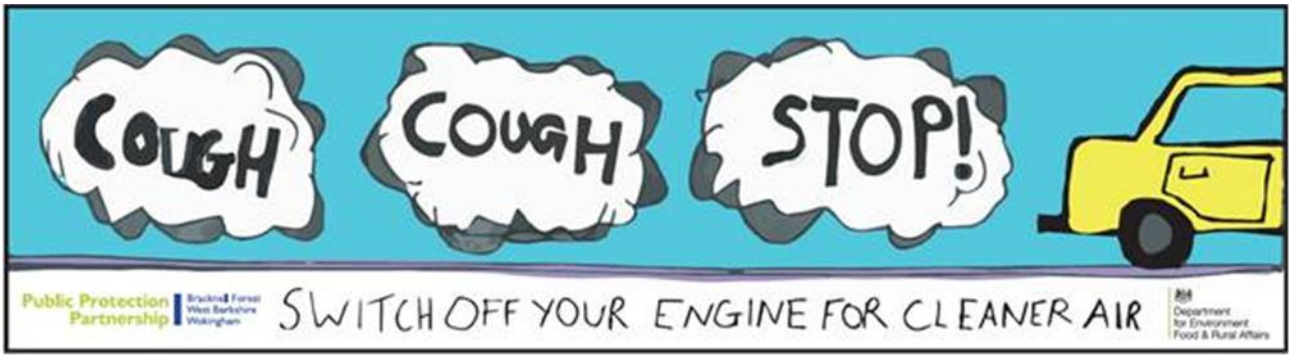
Area	Mitigation Measure	AQ Benefits	Cost	Deliverability	Wider Benefits
	around the school grounds				
Reducing emissions from car journeys	Implement a School Travel Plan that supports and encourages sustainable travel. Set accreditations. Focusing on improvement and use of public transport, cycling, walking, and car-sharing for both parents and staff	M	M	M	Promotion of sustainable transport
	Encourage drivers to turn their engine off outside schools, enforcing this if needed through fixed penalty notices to raise funds	M	L	S	Awareness raising
	Providing signage, walking route maps etc to encourage parents and children to walk to school and take routes with lower exposure	L	L	S	Awareness raising, promotion of sustainable transport
Other sources	Produce a School Logistics Plan to manage the sustainable delivery of goods and materials to school by consolidated deliveries, changing time of day or use of low emission vehicle.	M	M	M	Noise reductions, promotion of sustainable transport
	Reuse and recycle waste to reduce dust from waste materials around the school grounds	L	L	S	Reduced operating costs
Ongoing monitoring and awareness	Provide information on air quality forecasts (AQ alerts or texts) to	L	L	S	Awareness raising, promotion of

Area	Mitigation Measure	AQ Benefits	Cost	Deliverability	Wider Benefits
	parents to encourage them to take different journeys to school in high pollution episodes				sustainable transport
	Conduct further AQ monitoring in targeted areas eg to consider areas of exposure, on key routes	L	M	S	Awareness raising
	Deliver lessons focusing on local air quality and targeted measures, incorporating into the curriculum where possible	L	L	S	Awareness raising

Specific Mitigation Measures for School

Mitigation Measure	AQ Benefits	Cost	Deliverability	Wider Benefits
Plan PE lessons to coincide with times of day that typically have lower measured PM concentrations (e.g. in the afternoon and mid-week)	L	L	S	Improved learning environment
Further investigate traffic flows in the area by day of week to determine differences between weekday and weekend to identify any specific sources to target	L	L	S	Promotion of sustainable transport

Appendix B


COUGH
COUGH
STOP!
Public Protection Partnership
SWITCH OFF YOUR ENGINE FOR CLEANER AIR
Department for Environment Food & Rural Affairs

Appendix C

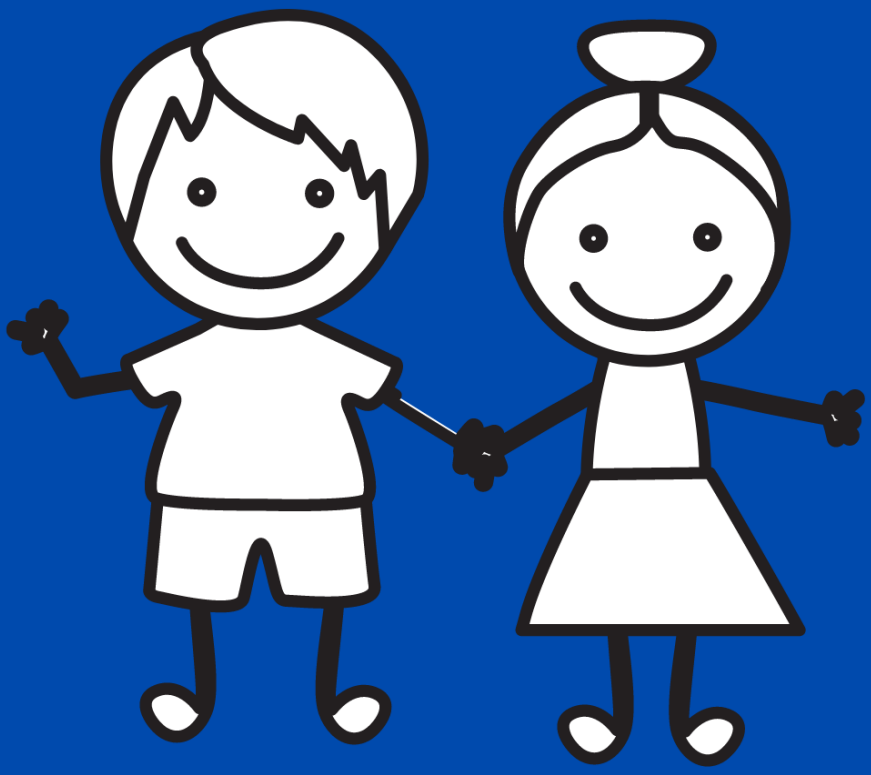
Bracknell Forest Council

West Berkshire Council

Wokingham Borough Council

Department for Environment Food & Rural Affairs

Don't idle.
Save money.
Clean air.



Bracknell Forest Council

West Berkshire Council

WOKINGHAM BOROUGH COUNCIL

Department for Environment Food & Rural Affairs

Cough cough. Turn your engine off.

Bracknell Forest Council

West Berkshire Council

WOKINGHAM BOROUGH COUNCIL

Department for Environment Food & Rural Affairs