



The PES

Air Quality – Technical Note

25th March 2024

**Southern Gas Network site
Canal Road
Gravesend
DA12 2PA**

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1.0 Executive Summary

This air quality technical note has been prepared by The PES Ltd in support of a full planning application submitted to Gravesham Borough Council (GBC) for open storage uses at the former Southern Gas Network gas holder site on Canal Road.

The site itself is based in a mixed use residential/industrial area with dwellings across Canal Road.

There is a requirements to submit an air quality assessment in order for the application to be validated, further clarified as a technical note the consider the potential impact of traffic generated by the proposals on local air quality and sensitive receptors.

This includes consideration of the impact upon the nearest, but remote AQMA, the Gravesend A226 One-way system AQMA, which is some 600m to the west. The most appropriate NO₂ monitoring site (GR47 – 565043,174173) within the AQMA recorded a 2022 annual NO₂ concentration average at 35.0 µg/m³.

Traffic generated by the proposed development has been considered with the submitted Transport Statement prepared by SLR Consulting

This concludes that the new storage development will add no more than 78 vehicle movements in total across the day, consisting of 44 HGVs and 34 cars / LGVs – an increase in traffic flows of no more than 0.5% based on the annual average daily traffic flow within the Gravesend A226 One-way system AQMA.

Given the most recent monitoring data taken from GBC's 2023 Air Quality Annual Status Report for the passive roadside monitoring location at GR78 - Canal Tavern Public House, Canal Road, Gravesham, DA12 2RS (565658, 174195), located on Canal Road based upon the same road network as the proposed storage site – recording 26.9µg/m³ – this figures being well within the required air quality objective.

It is the conclusion of this technical note is that impact of any traffic generated by the new open storage proposals will have a negligible impact on the air quality within the local micro environment, and will be further dispersed as traffic selects different routes away form the location and as such there are no air quality related issues that would impact the application as presented.

2.0 Introduction

The project at the former Southern Gas Network site is for a change of use to B1/B8/B2 for open storage and hard surfacing at circa 12,500sqm.

The location of the proposed development site is presented in Figure 1.

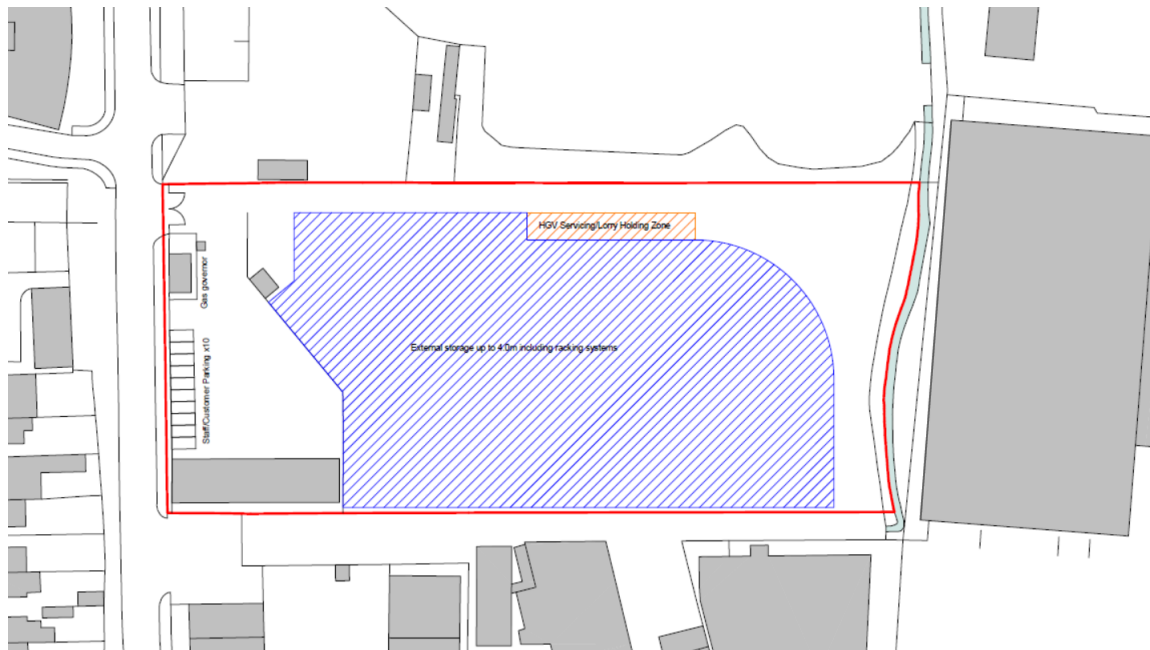


Fig 1. Site Location Plan

The site falls within the boundaries of Gravesham Borough Council

There is a validation requirement for the submission of an air quality assessment, on the assumption that proposed development would result in additional vehicle movement and activity which may impact on air quality resulting in an adverse impact on the local environment and the Gravesham A226 One-way system AQMA.

1.1 Initial Screening

National guidance requires an initial screening exercise

Stage 1 Screening Criteria:

- 10+ residential units or a site area of more than 0.5ha
- > 1,000 m² of floor space for all other uses or a site area greater than 1ha

Coupled with any of the following:

- > 10 parking spaces
- a centralised energy facility or other centralised combustion process

Consideration should still be given to the potential impacts of neighbouring sources on the site, even if an assessment of impacts of the development on the surrounding area is screened out

Stage 1 - The project is in the order of 10,000sqm with potentially over 10 car parking spaces

Stage 2: Indicative criteria for requiring an air quality assessment

- Cause a significant change in LDV traffic flows on local roads with flows of:
 - > 100 AADT within or adjacent to an AQMA
 - > 500 AADT elsewhere.
- Cause a significant change in HDV flows on local roads with relevant receptors. A change of HDV flows of:
 - > 25 AADT within or adjacent to an AQMA
 - > 100 AADT elsewhere.
- Realign roads, i.e. changing the proximity of receptors to traffic lanes. Where the change is 5m or more and the road is within an AQMA.
- Introduce a new junction or remove an existing junction near to relevant receptors. Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
- Introduce or change a bus station. Where bus flows will change by:
 - > 25 AADT within or adjacent to an AQMA
 - > 100 AADT elsewhere.
- Have an underground car park with extraction system which is within 20 m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
- Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors.

Stage 2 – the project is outside of any AQMA – it is not going to result in a change of LDV Flows > 500 AADT, or of HDV > 100 AADT elsewhere. (Ref Transport Statement SLR Consulting).

Given the location of the proposed new storage areas in a mixed used area with potentially >100 high sensitivity receptors with 100m, it is considered that the

project would not have a significant impact on air quality for neighbours or users of the new facility – nor would it conflict with measures contained within the current Epping Forest Local Plan

Accordingly the scope of works proposed are for a simple assessment approach; as the site is not within an AQMA, operational traffic could impact upon sensitive receptors on route to/from site, and that the impact of construction dust should be considered during site development.

3.0 Policy Context

An overview of the relevant policy drivers for the assessment is provided in the following section.

3.1 European Legislation

Within the European Union, ambient air quality is currently regulated through the Ambient Air Quality Directive 2008/50/EC and the Fourth Daughter Directive 2004/107/EC. These directives set limit values and target values for ambient pollutant concentrations. The limit values are legally binding and must not be exceeded, whereas the target values are to be attained where it is cost effective to do so.

The Ambient Air Quality Directive provides limit values for sulphur dioxide (SO₂), nitrogen dioxide (NO₂), benzene (C₆H₆), carbon monoxide (CO), lead (Pb) and particulate matter (PM₁₀ and PM_{2.5}). The Fourth Daughter Directive provides target values for arsenic (As), cadmium (Cd), nickel (Ni), benzo(a)pyrene (B(a)P), mercury (Hg) and polycyclic aromatic hydrocarbons (PAH).

The EU limit values have been adopted into UK law via the Air Quality Standards Regulations 2010.

In the context of the proposed development, the primary pollutants of concern are NO₂, PM₁₀ and PM_{2.5} from traffic on roads close to the site. A summary of the European limit values for the protection of human health for these pollutants is presented in Table 1.

Table 1: European Limit Values for the Protection of Human Health

Pollutant	Averaging Period	Limit Value (µg/m ³)	Comments
NO ₂	1 Hour	200	Not to be exceeded more than 18 times per calendar year (equivalent to the 99.8th percentile of 1-hour means)
	Calendar Year	40	
PM ₁₀	24 Hour	50	Not to be exceeded more than 35 times per year (equivalent to the 90.4th percentile of 24-hour means)
	Calendar Year	40	
PM _{2.5}	Calendar Year	25	Stage 1 LV (to be met by 01/01/15)
	Calendar Year	20	Stage 2 LV (to be met by 01/01/20)

It should be noted that commercial uses are not required to comply with the annual mean air quality objectives (see extract from the LAQM.TG(22)) below.

Box 1.4: Examples of where the air quality objectives should/should not apply		
Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
24-hour mean and 8-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties ⁷ .	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-min mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	

Fig 2 – LAQM Box 1.4

3.2 National Legislation

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

The Air Quality Strategy for England, Wales and Northern Ireland was published in 2007 and sets out policy targets (objectives) for SO₂, NO₂, C₆H₆, CO, Pb, PM₁₀, PM_{2.5}, 1,3-butadiene (C₄H₆) and PAH. These objectives are generally in line with those set by the European Directives, although more stringent particulate and benzene objectives apply in Scotland (and in Northern Ireland for benzene).

The Air Quality Objectives (AQO) for NO₂, PM₁₀ and PM_{2.5} in England do not differ from those presented in Table 1.

Local Air Quality Management

The framework for Local Air Quality Management (LAQM) in the UK was introduced by the Environment Act 1995. Local Authorities are required to regularly review and assess air quality to establish whether there are any locations where pollutant concentrations exceed the relevant air quality objectives or EU limit values.

Where an exceedance is identified the local authority is obliged to declare an Air Quality Management Area (AQMA) and prepare an Action Plan setting out measures to improve air quality and achieve compliance with the objective(s).

The National Planning Policy Framework

The National Planning Policy Framework (NPPF 2021) sets out the Government's policies for planning and how these should be applied. With regard to air quality, the NPPF states that:-

para. 186.

Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement.

So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications.

Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.

3.3 Local Policy

The site is within Gravesham Local Plan - Core Strategy adopted September 2014

The Core Strategy includes the strategic objective (SO17), to Increase accessibility, reduce the need to travel, minimise congestion and • improve air quality through the improved provision of local public transport and the provision of local jobs and services.

3.3.1 Air Quality Management Areas

There are 3 AQMAs in Gravesend, the most relevant of which is the:-

- Gravesend A226 One-way system AQMA

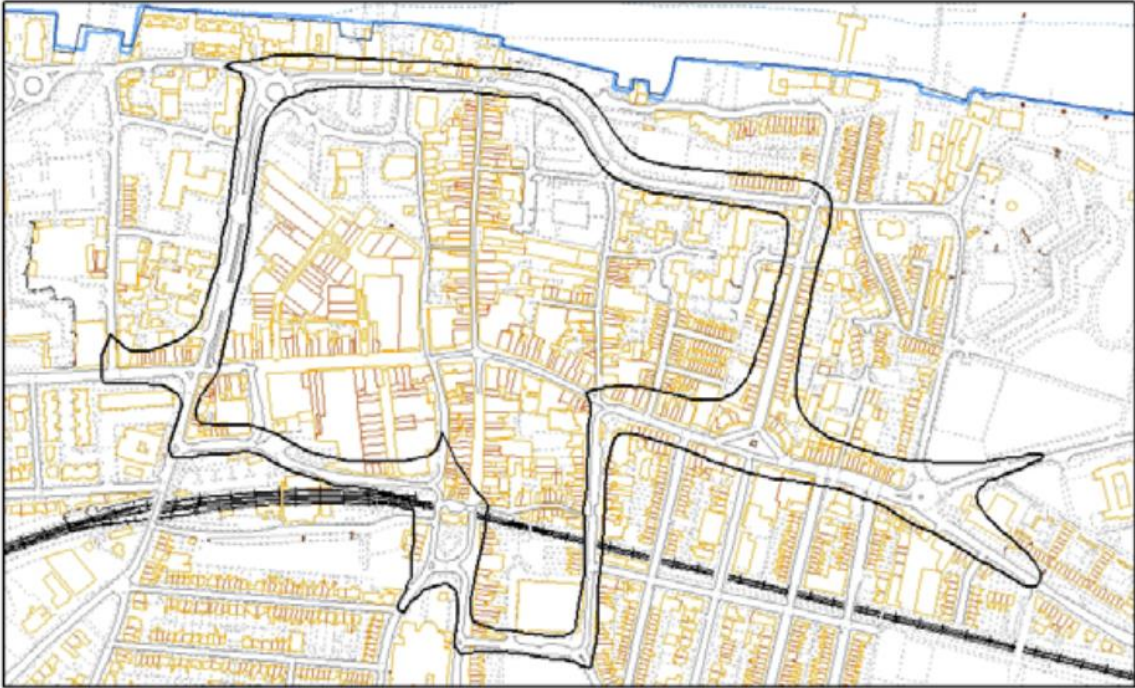


Fig 3 - Gravesend A226 One-way system AQMA

4.0 Construction Dust

This section outlines the assessment methodology, taking into account all relevant national and local policies and technical guidance relating to air quality impacts of site activities.

4.1 Construction Dust

The potential impact of dust generated during site enabling, earthworks and construction works at the proposed development has been undertaken in accordance with the Institute of Air Quality Management (IAQM) construction dust guidance . A full description of the construction dust methodology is provided in **Appendix A** – IAQM Construction Dust Methodology.

A detailed assessment of dust impacts is required where there are human or ecological receptors within:

- 50m of the site boundary; or
- 50m of the route(s) used by construction vehicles on public roads, up to 500m from the site entrance(s).

The IAQM/ SPG methodology allows the potential risk of dust soiling and human health effects to be determined, based primarily on the sensitivity of nearby receptors (human and ecological) and the anticipated magnitude of the dust emission due to:

- Demolition;
- Earthworks;
- Construction; and
- Track-out (re-suspended dust from vehicle movements).

The assessment of dust risk is also based on professional judgement taking into account factors such as the prevailing wind direction, the proposed construction phasing, the likely duration of dust raising activities, local topography and existing air quality.

A range of best practice mitigation measures are provided within the guidance, which are dependent on the level of dust risk attributed to the site. It is recommended that these measures are incorporated into a Dust Management Plan (DMP) for the proposed development which could be secured by condition.

The significance of the residual impacts following appropriate mitigation is determined by professional judgement.

Best Practice Guidance for dust control will be implemented, as appropriate, during the construction phase through the Dust Management Plan (DMP) for the proposed development.

The risk of dust soiling and human health impacts from the site has been assessed as medium:-

- Development of between 1,000 and 15,000 square metres of land and;
- Development of between ten to 150 properties and;
- Potential for emissions and dust to have an intermittent or likely impact on sensitive receptors

Prior to mitigation, therefore in accordance with the IAQM guidance it is recommended that the measures detailed in the table below are incorporated into the DMP. The significance of dust impacts on nearby receptors following the implementation of appropriate and best practice mitigation is considered to be negligible.

4.2 Sensitivity of the Area to Dust Impacts

The assessment of dust impacts is dependent on the proximity of the most sensitive receptors to the site boundary. The area is generally commercial in nature with very limited residential dwellings accommodation in the surrounding areas, the occupants of which would be considered as **HIGH** sensitivity receptors.

Accordingly, with >100 High Sensitivity Receptors that are within 100m of the site boundary, the sensitivity of the area to dust soiling effects on people and property could be considered **MEDIUM**.

Finally, for the potential range of sensitive receptors in the range >100 within 100m of the development site, and with the background PM levels at <24µg/m³, sensitivity of the area to human health impacts would be considered **LOW**.

For ecology, the site is considered a **LOW** sensitivity receptor - locations with a local designation where the features may be affected by dust deposition.

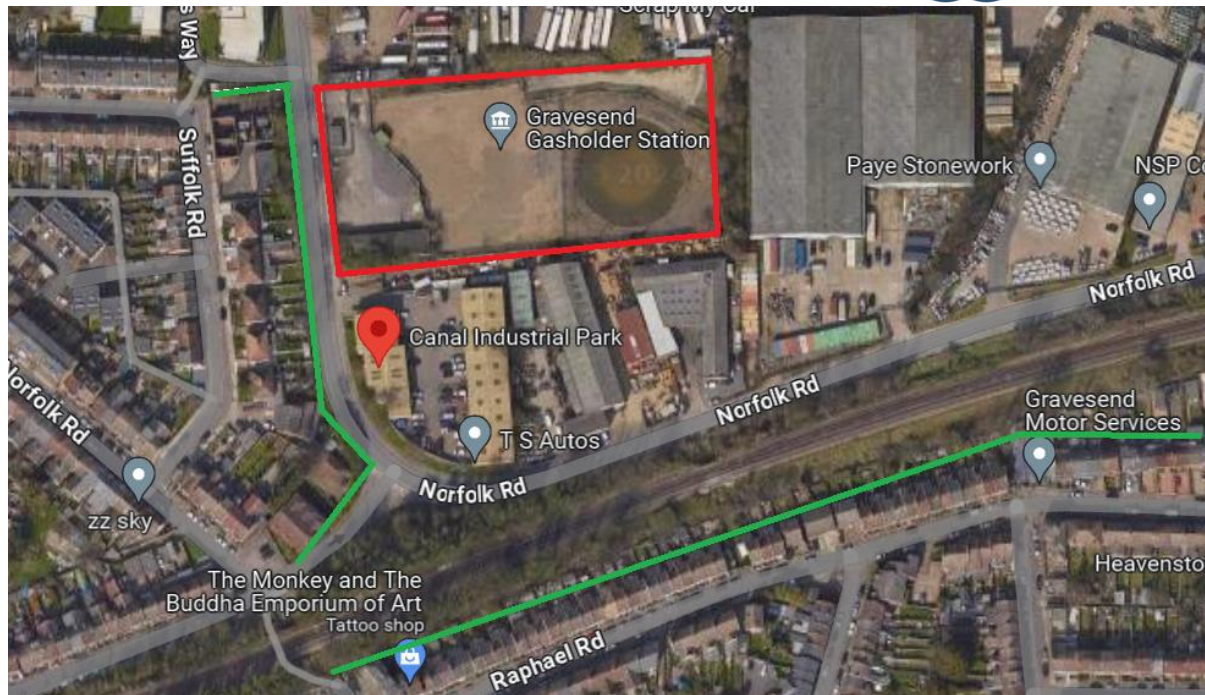


Figure 4 – Local sensitive receptors - Proposed development site – Sensitive Receptors

The precise behaviour of the dust, its residence time in the atmosphere and the distance it may travel before being deposited, will depend upon a number of factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.

6.1.2 Dust Emission Magnitude

The risk of dust arising in sufficient quantities to cause annoyance and/or health and/or ecological impacts should be determined using four risk categories: negligible, low, medium and high risk.

A development is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emission
- magnitude as small, medium or large (see Table 2);

and

- the sensitivity of the area to dust impacts, which is defined as low, medium or high sensitivity.

Table 2 – Dust emission risk categories

Activity	Dust Emission Class		
	Large	Medium	Small
Demolition	Total building volume >50,000 m ³ , potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level	Total building volume 20,000 – 50 000m ³ , potentially dusty construction material, demolition activities 10-20 m above ground level	Total building volume <20,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months
Earthworks	Total site area >10,000 m ² , potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes	Total site area 2,500 – 10,000 m ² , moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m - 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes	Total site area <2,500 m ² , soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <10,000 tonnes, earthworks during wetter months
Construction	Total building volume >100,000 m ³ , piling, on site concrete batching; sandblasting	Total building volume 25,000 m ³ – 100,000 m ³ , potentially dusty construction material (e.g. concrete), piling, on site concrete batching	Total building volume <25,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber)
Track out	>50 HDV (>3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m	10 – 50 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100 m;	<10 HDV (>3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50 m.

These factors are combined to determine the risk of dust impacts with no mitigation applied (see Table 8 below). The risk category assigned to the development can be different for each of the four potential activities (demolition, earthworks, construction and trackout).

Demolition - the site is currently vacant – no demolition proposed - dust emission is considered to be 'small'.

Earthworks - the only earthworks for the project will involve minor cut'n'fill levelling to create the new storage/distribution yard

Volume of material moved would not exceed 2,000t. The site area is large at circa 10,000m² and the number of earth moving vehicles could exceed 5 vehicles at any one time

Due to the potential of material to be moved, the magnitude of the dust emission during the earthworks phase is therefore also considered to be 'medium'.

Construction - Dust emissions during construction will depend on the scale of the works, method of construction, construction materials and duration of build.

The proposed development will be the levelling of the site, and the laying of new hard surfaces and sub-structures

Due to the scale of the site and the potential for batching, the magnitude of the emission during construction is considered to be 'medium'.

Trackout – due to the size of the site, there is a strong possibility of long unmaded roads close to local residences.

The magnitude of the emission associated with trackout is considered to be 'medium'.

Table 3: Risk of Dust Impacts Prior to Mitigation

Dust Source	Emissions Magnitude
Demolition	Small
Earthworks	Medium
Construction	Medium
Track Out	Medium

6.1.3 Assessment of Dust Risk Prior to Mitigation

Referring to Chapter 7 of the IAQM "Assess the Risk of Dust Impacts" – tables 3 – 9; a summary of the potential risk of dust impacts prior to mitigation, based on the medium sensitivity of the area to dust soiling and low sensitivity to human health impacts is presented in Table 4.

Table 4: Risk of Dust Impacts Prior to Mitigation

Dust Source	Emissions Magnitude	Human Health Risk	Dust Soiling Risk	Ecology
Demolition	Small	Negligible	Low	Negligible
Earthworks	Medium	Low	Medium	Low
Construction	Medium	Low	Medium	Low
Track Out	Medium	Low	Low	Low

5.0 Transport Impacts

This section outlines the assessment methodology, taking into account all relevant national and local policies and technical guidance relating to air quality.

This technical note will consider the expected increase in traffic associated with the new industrial development at Meadowfield, assess this impact of this on the nearby AQMA and any potential impact on the air quality within the AQMA.

4.1 Operational Traffic

The Environmental Protection UK (EPUK)/ IAQM planning guidance states that for developments within or near an AQMA, a detailed assessment of traffic-related impacts is required where:

- There is a change in the annual average daily traffic (AADT) flow of light goods vehicles (LGV) of more than 100 vehicles; and/or
- There is a change in the AADT flow of heavy goods vehicles (HGV) of more than 25 vehicles; and/or There is a change in the road re-alignment by more than 5m; and/or
- A new junction is introduced, which will significantly alter vehicle speeds.

The project at Canal Road site does trigger the amount of additional HGV movements and as such, the impact of same has to be considered. In more detail The submitted Transport Statement summarises:-

- The proposed development will be safely connected to, and well-integrated with, the local transport network. Vehicular, pedestrian and cycle access to the site will be provided via Canal Road
- Parking provisions considered sufficient for the operation of the proposed development and provides a robust assessment in line with the requirements of the associated transport statement (SLR Consulting)
- The traffic flows associated with the proposed development will be satisfactorily accommodated on the local highway network without resulting in any severe impacts on the free flow of traffic.
- A Construction Management Plan will be submitted to and agreed with the Local Planning Authority at the implementation stage in order to ensure that construction works do not have a detrimental impact on the surrounding community, both for the construction on-site and the transport arrangements for servicing the site.

4.2 Existing Traffic Data

The DFT Road traffic statistics website provides a summary and street-level traffic data for road-links on the motorway, 'A' road and minor road network in Great Britain.

Site number 16774 – Located on the A226 within the Gravesend A226 One-way system AQMA, has the latest traffic data as follows:

In 2017 – the latest available data demonstrates an AADF at **13,965** vehicles daily, which includes all vehicles; heavy good vehicles and buses representing **4.9%** of the total.

Allowing for a 7% increase in traffic flow during the ensuing years, give a conservative AADF at **14,943**.

There is no available

4.3 Predicted Traffic Generation

The submitted Transport Statement by SLR Consulting has undertaken trip generation predictions based upon the appropriate TRICS data.

The data identifies 78 additional vehicle movements on the road along the route to/from the new storage complex an increase in the AADF at 0.5%.

This figure assumes that all traffic moves to/from the site in the same direction, through the AQMA, whereas it is reasonable to assume that some traffic will disperse in each direction, so it can be assumed that actual impact will be less than 0.5%.

6.0 Local Air Quality

Through an analysis of local monitoring data, an understanding of existing air quality in the vicinity of the proposed development is provided.

6.1 Local Air Quality Monitoring

6.1.1 Automatic Data

Gravesham Borough Council undertook automatic (continuous) monitoring at 2 sites during 2021. The most relevant roadside location is identified below:-

Table 5: Automatic Monitoring Sites

Site Name	Type	Easting	Northing	Pollutants Monitored
ZG2 Gravesham A2	Roadside	562589	172076	NO ₂ , PM ₁₀ ,

Annual mean NO₂ and PM₁₀ concentrations measured at the above location between 2018 and 2022 have been obtained from Gravesham Council's Air Quality Annual Status Report for 2022 which are summarised in Table 6, together with the number of measured exceedances of the short-term AQO's.

The data indicate that urban background NO₂ and PM₁₀ concentrations in the area are likely to be within the relevant long and short-air quality standards.

Table 6: Roadside NO₂, PM₁₀ concentrations measured at ZG2 Monitoring site

Criteria	2018	2019	2020	2021	2022
Annual Mean NO ₂ (µg/m ³)	29.9	29.1	23.7	22.8	22.2
Number of Predicted Exceedances of the 1-Hour Mean AQO of 200 µg/m ³	0	0	0	0	0
Annual Mean PM ₁₀ (µg/m ³)	15.4	15.3	16.3	16.0	15.3
Number of Predicted PM ₁₀ Exceedances of the 24-Hour Mean AQO of 50 µg/m ³	1	1	1	0	0

6.1.2 Non-automatic Data

Gravesham Borough Council undertook non- automatic (i.e., passive) monitoring of NO₂ at 66 sites during 2022.

The nearest and most relevant tube to the proposed development for the assessment of roadside concentrations GR78 - Canal Tavern Public House, Canal Road, Gravesham, DA12 2RS (565658, 174195), just 70/80m along from the proposed development site on the same road network.

A summary of the annual average NO₂ concentrations measured at this location between 2018 and 2022 is presented in Table 7.

Table 7: Annual Mean NO₂ Concentrations Measured by Diffusion Tube GR78

Site ID	2017	2018	2019	2020	2021
GR78 Canal Tavern Public House	31.3	32.5	26.2	27.5	26.9

The data indicates that annual mean NO₂ concentrations along Canal Road into the local AQMA are extremely unlikely to exceed the air quality standard of 40 µg/m³.

Measurements across the UK have shown that the 1-hour mean AQO for NO₂ may also be exceeded where the annual mean concentration is greater than 60µg/m³. The above noted data therefore indicates that an exceedance of the short-term objective will also not occur.

Urban background emission levels are measured at a nearby locations at tubes Gr19, GR69, GR72 and GR 75

In 2022, the above sites recorded an average background NBO2 emissions level at 17.53 µg/m³.

Netting off the background emission levels indicates that the impact of traffic at the roadside location at Canal Road amounts to an annual average of 9.38µg/m³.

7.0 Potential Impacts

The potential impacts and significance of the impacts on air quality within the AQMA as result of the proposed development at the gas holder site are considered below.

6.2 Traffic Generation Impacts

It has been identified that the traffic generated by the proposed development could increase AADF for traffic by 0.5%

The most appropriate monitoring site recorded a an annual long term concentrations of $26.9\mu\text{g}/\text{m}^3$ for NO_2 well within required air quality objective standards.

It should be noted that due to a significant change in the vehicle mix on the UK roads, with a very significant reduction in diesel cars (some 30% reduction since 2018) and an increase in electric and hybrid vehicles – the above monitored NO_2 levels can be expected to further reduce in the coming years.

This technical note would suggest that the worse case impact on air quality within the AQMQ would be a 0.5% increase the impact of traffic related NO_2 levels to $9.43\mu\text{g}/\text{m}^3$, including background concentration at $17.53\mu\text{g}/\text{m}^3$, an overall figure $26.96\mu\text{g}/\text{m}^3$, an increase at circa 0.22% and still well within air quality objectives

In practical terms, this can be expected to be considerably lower due to:-

- The ongoing reduction in background and roadside NO_2 emissions associated with the significance change in vehicle mix.

The results are tabulated below.

Table 7 – Uncertainty Analysis – Sensitive Receptors

A670	NO_2
2022 – No development	26.90
2024 – With development	26.96

The data in Table 7 identifies that the predicted increase in NO_2 levels are at $0.06\mu\text{g}/\text{m}^3$ or less.

The Institute of Air Quality Management (IAQM) offers a framework for describing the impacts (the change in concentration of an air pollutant) at individual receptors.

The term Air Quality Assessment Level (AQAL) is used to include air quality objectives or limit values, where these exist – see Figure 5.

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76 - 94% of AQAL	Negligible	Slight	Moderate	Moderate
95 - 102% of AQAL	Slight	Moderate	Moderate	Substantial
103 - 109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Fig 5 - Impact descriptors for individual receptors

The assessment location at Canal Road and the nearby/associated AQMA is within the band of 75% or less of AQAL for 2021 without the impacts of the proposed development; the above noted 0.22% increase in air pollutants would be considered “**Negligible**” following the IAQM guidance.

The above data can be then related to the impact on the nearest AQMA – the Gravesend A226 One-way system AQMA, at some 600m remote from Canal Road, with plenty of opportunities for traffic to disperse away from the road network within the AQMA, clearly the impact on the AQMA will be less than 0.2% and also have a negligible impact

8.0 Summary, Conclusions & Mitigation

The following summarise the outcomes of the assessment and provides details of any air quality constraints to the development of the site.

An assessment has been undertaken to assess the potential impacts on local air quality associated with the operation of the proposed development.

Theis technical notes that there is a worse case impact on the AQMA of a 0.22% increase NO₂ emissions based upon the last year of available data – 2022.

The figures at 26.96µg/m³ is a worse case scenrio and is well within the required air quality standards and the increase in NO₂ levels would be considered “negligible” following the appropriate industry guidance.

Based on these results of the assessment, it is considered the proposed new development would not cause a significant or harmful impact on local air quality.

8.1 Mitigation

Best Practice Guidance for dust control will be implemented, as appropriate, during the construction phase through the Dust Management Plan (DMP) for the proposed development.

The risk of dust soiling and human health impacts from the site has been assessed as “**Medium**” prior to mitigation, therefore in accordance with the IAQM guidance it is recommended that the measures detailed in Table 8 are incorporated into the DMP. The significance of dust impacts on nearby receptors following the implementation of appropriate and best practice mitigation is considered to be negligible.

Table 8 Recommended Mitigation Measures

Description	Mitigation Measure
General	- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary; this may be the environment manager/engineer or the site Manager. - Display the head or regional office contact information.
Site management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.

	• Make the complaints log available to the local authority when asked. • Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation in the log book.
Monitoring	• Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked. • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Preparing and maintaining the Site	• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. • Erect solid screens or barriers around dusty activities or at the site boundary that is at least as high as any stockpiles on site. • Fully enclose the site or specific operations where there is a high potential for dust production and the site is active for an extensive period • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods. • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. • Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle & machinery and sustainable travel	• Ensure all vehicles switch off engines when stationary - no idling vehicles. • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips.

	- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. - Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	Avoid bonfires and burning of waste materials
Demolition	- Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. - Avoid explosive blasting, using appropriate manual or mechanical alternatives. - Bag and remove any biological debris or damp down such material before demolition.
Construction	Ensure sand and other aggregates are stored in bundled areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Track out	- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. - Avoid dry sweeping of large areas. - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. - Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). - Access gates to be located at least 10m from receptors where possible.

8.1.1 Method Statement

A method statement should cover all phases of the development and take account of all contractors or sub-contractors. It should be submitted to the local planning authority (LPA) prior to any works being carried out and include a timetable of dust generating activities accompanied with proposed dust control measures. It is expected that this will be in the form of a full CEMP secured by planning condition.

The content of a Method Statement will be determined by a site specific evaluation but typical features to include are outlined below:-

- summary of work to be carried out
- description of site layout and access – including proposed haul routes, location of site equipment including supply of water for damping down, source of water (wherever possible from dewatering or extraction), drainage and enclosed areas
- inventory and timetable of all dust generating activities
- list of all dust and emission control methods to be used
- details of any fuel stored on site
- Identification of an authorised responsible person on-site for air quality. Ideally this person needs to have knowledge of pollution control and vehicle emissions;
- summary of monitoring protocols and agreed procedure of notification to the local authority nominated person(s)
- a site log book to record details and action taken in response to exceptional incidents or dust-causing episodes. It should also be used to record the results of routine site inspections.

8.2 Operational Phase

The proposed development will include additional secure level cycle spaces to encourage sustainable transport.

The site is accessible by public transport and to people travelling on foot or bicycle.

Appendix A

IAQM CONSTRUCTION DUST METHODOLOGY

Factors defining the sensitivity of a receptor to dust impacts are presented in Table A1.

Table A1: Receptor Sensitivity

Receptor Sensitivity	Human Health	Dust Soiling	Ecological
High	- Locations where members of the public are exposed over a time period relevant to the air quality objectives for PM₁₀ (a) - Examples include residential dwellings, hospitals, schools and residential care homes.	- Regular exposure - High level of amenity expected. - Appearance, aesthetics or value of the property would be affected by dust soiling. - Examples include residential dwellings, museums, medium and long-term car parks and car showrooms.	- Nationally or Internationally designated site with dust sensitive features (b) - Locations with vascular species (c)
Medium	- Locations where workers are exposed over a time period relevant to the air quality objectives for PM₁₀ (a) - Examples include office and shop workers (d)	- Short-term exposure - Moderate level of amenity expected - Possible diminished appearance or aesthetics of property due to dust soiling - Examples include parks and places of work	- Nationally designated site with dust sensitive features (b) - Nationally designated site with a particularly important plant species where dust sensitivity is unknown
Low	- Transient human exposure - Examples include public footpaths, playing fields, parks and shopping streets	- Transient exposure - Enjoyment of amenity not expected. - Appearance and aesthetics of property unaffected - Examples include playing fields, farmland (e), footpaths, short-term car parks and roads	- Locally designated site with dust sensitive features (b)
a) In the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more in a day. b) Ecosystems that are particularly sensitive to dust deposition include lichens and acid heathland (for alkaline dust, such as concrete). c) Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee. d) Does not include workers' exposure to PM₁₀ as protection is covered by Health and Safety at Work legislation. e) Except commercially sensitive horticulture.			

The sensitivity of the area as a whole is dependent on the number of receptors within each sensitivity class and their distance from the source. Human health impacts are also dependent on the existing PM₁₀ concentrations in the area.

Table A2 and Table A3 summarise the criteria for determining the overall sensitivity of the area to dust soiling and health impacts respectively. The sensitivity of the area to ecological impacts is presented in Table A4.

Table A2: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source			
		<20m	<50m	<100m	<350m
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A3: Sensitivity of the Area to Health Impacts from Dust

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration (µg/m³)	Number of Receptors	Distance from the Source				
			<20m	<50m	<100m	<200m	<350m
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low	Low

Table A4: Sensitivity of the Area to Ecological Impacts from Dust

Receptor Sensitivity	Distance from the Source	
	<20m	<50m
High	High	Medium
Medium	Medium	Low
Low	Low	Low

The magnitude of the dust impacts for demolition, earthworks, construction and trackout is classified as small, medium or large depending on the scale of the proposed works as detailed in Table A5.

Table A5: Dust Emission Magnitude

Receptor Sensitivity	Large	Medium	Small
Demolition	- Total building volume >50,000m³ - Potentially dusty material (e.g. concrete) - Onsite crushing and screening - Demolition activities >20m above ground level.	- Total building volume 20,000 - 50,000m³ - Potentially dusty material - Demolition activities 10 - 20m above ground level.	- Total building volume <20,000m³ - Construction material with low potential for dust release - Demolition activities <10m above ground level - Demolition during wetter months
Earthworks	- Total site area >10,000m² - Potentially dusty soil type (e.g. clay) - >10 heavy earth moving vehicles active at any one time - Formation of bunds >8m in height - Total material moved >100,000 tonnes	- Total site area 2,500 - 10,000m² - Moderately dusty soil type (e.g. silt) - 10 heavy earth moving vehicles active at any one time - Formation of bunds 4 - 8m in height - Total material moved 20,000 - 100,000 tonnes	- Total site area <2,500m² - Soil type with large grain size (e.g. sand) - <5 heavy earth moving vehicles active at any one time - Formation of bunds <4m in height - Total material moved <20,000 tonnes - Earthworks during wetter months
Construction	- Total building volume >100,000m³ - On site concrete batching - Sandblasting	- Total building volume 25,000 - 100,000m³ - Potentially dusty construction material (e.g. concrete) - On site concrete batching	- Total building volume <25,000m³ - Material with low potential for dust release (e.g. metal cladding or timber)
Trackout	- >50 HGV movements in any one day (a) - Potentially dusty surface material (e.g. high clay content) - Unpaved road length >100m	- 10 - 50 HGV movements in any one day (a) - Moderately dusty surface material (e.g. silt) - Unpaved road length 50 - 100m	- <10 HGV movements in any one day (a) - Surface material with low potential for dust release - Unpaved road length <50m

a) HGV movements refer to outward trips (leaving the site) by vehicles of over 3.5 tonnes

For each dust emission source, the worst-case area sensitivity is used in combination with the dust emission magnitude to determine the risk of dust impacts prior to mitigation as illustrated in Tables A6 and A7.

Table A6: Risk of Dust Impacts from Demolition, Earthworks and Construction

Area Sensitivity	Distance from the Source		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible Risk

Table A7: Risk of Dust Impacts from Trackout

Area Sensitivity	Distance from the Source		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible Risk
Low	Low Risk	Low Risk	Negligible Risk

