

10. Air Quality

Introduction

- 10.1 The original EIA submission (March 2014) assessed the potential for a local air quality impact from the proposed development, primarily due to emissions from the operational aspects of the proposed facilities.
- 10.2 The key findings in 2014 are as follows:
- There is a potential for a slight deterioration in local air quality due to emissions from the proposed new EfW, though its emissions will be constrained to comply with the Industrial Emissions Directive and there will be no breach of an air quality standard or an impact to human health or the environment.
 - There is a potential for a slight deterioration in local air quality due to emissions from the proposed new MBT, and a potential risk of odour at the site boundary to the south east of the MBT. That odour risk is assessed to be very small with odour emissions, if they occurred, infrequent and transient, the risk being mitigated by appropriate waste management procedures and associated odour management planning.
 - A visible plume from the EfW or MBT stacks is likely to occur for around 20% of the time, but will invariably be within the site boundary and a potential hazard due to a visible plume near ground is not predicted.
 - There is a potential for a slight deterioration in the existing local air quality due to emissions from vehicles associated with the proposed new facility. However local air quality will remain good and well within national air quality standards.
 - There is potential for transient adverse effects to air quality due to dust during construction of the proposed development though those effects will be constrained to the construction period and are likely to be localised to within or very close to the application site.
- 10.3 An addendum to the EIA Air Quality chapter was also prepared in September 2014 to assess the effect of a proposed extension to the Bottom Ash Bunker (JET) section of the EfW for 5-11m to the south east, with subsequent construction of the Incinerator Bottom Ash (IBA) building at a later date. That change to the Bottom Ash Bunker was relatively minor within the overall scale of the EfW and MBT complex but as the air dispersion modelling includes building effects, the dispersion model was rerun to include the change in dimensions of the Bottom Ash Bunker. It was concluded that the air quality appraisal conclusions within the ES Chapter 14 were not affected by the minor extension to the EfW Bottom Ash Bunker or timing of construction of the IBA building, and hence there was no change to the identified residual air quality effects and their significance.
- 10.4 In 2016 FEI was prepared to assess the potential for an effect on the predicted dispersion of emissions from the EfW by the impact of the Ballyutoag Wind Farm which had been granted

planning permission (planning reference T/2014/0478/F). The assessment, which used ADMS v5.1.2 to model the effect of the wind turbines on dispersion, showed that the planned nearby wind turbines are predicted to slightly affect the distribution of the annual average levels, but not the maximum levels used in the air quality assessment process.

- 10.5 This further addendum to the EIA Chapter 14 identifies relevant changes (since the March 2014 assessment) and assesses whether they might affect the approach to the air quality assessment and its findings for a new operation commencement date of 2023. As the design parameters relating to emissions from the MBT or EfW remain the same as for the ES in 2014, potential air quality changes are likely to be limited to future background concentrations and vehicle movement forecasts. This addendum should be considered along with the original 2014 assessment Chapter and subsequent submissions in 2014 and 2016.
- 10.6 Third party representations regarding the potential for an adverse air quality or human health impact were considered at the Planning Appeals Commission hearing in October 2016. A third party representation was submitted to DfI Strategic Planning Division on 6th January 2019 regarding the toxicity of PM2.5 (fine particulate matter that has a diameter of less than 2.5 micrometres) with supporting evidence a study of particulate collected from a municipal solid waste incinerator in Shanghai, China. The Environmental Statement Chapter 14 Air Quality provides a detailed appraisal of potential emissions of particulate matter (PM10, PM2.5 and deposited dust) following the same or similar methodology to many other similar installations for residual waste treatment which have been granted planning permission across the UK, which has been accepted by the NIEA IPRI. As such and with the findings of the air quality assessment in 2014 which showed no basis for concern due to potential particular emissions, no further assessment of emissions of particulate matter is required.
- 10.7 It is also noted that since 2014 Council boundaries have been reorganised and the application site sits within the Antrim and Newtownabbey Borough Council Administrative area and adjacent to the Belfast City Council area.

Methodology

- 10.8 The air quality assessment is based upon comparison of the baseline local air quality (current and projected without the development proposals) at the application site to the air quality impacts predicted to result from the proposed development.
- 10.9 Operation of the proposed development requires an environmental permit issued by the NIEA (a draft of which has been issued). Therefore for emissions to air from the MBT and EfW the assessment methodology outlined by the Environment Agency's environmental permitting guidance, in particular its Horizontal Guidance H1 Environmental Risk Assessment and associated H1 Annex A – Amenity and accident risk from installations and waste activities, and Annex F – Air Emissions, is applied.
- 10.10 The H1 Annex A and Annex F guidance was withdrawn on 1st February 2016 but Annex F was replaced at the same time with guidance published online 'Air emissions risk assessment for your environmental permit' (<https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit>)

your-environmental-permit) which effectively outlines the same approach as was published prior to February 2016 within the H1 Annex F. Therefore the approach applied for the ES Chapter 14 air quality assessment remains appropriate for the proposed development.

10.11 To assess the effect from the impact of increased traffic the methodology outlined by the UK Design Manual for Roads and Bridges (DMRB) is applied. Additionally, since 2014 a Working Group has published guidance from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes titled 'Land-Use Planning & Development Control: Planning for Air Quality', January 2017. That guidance applies lower thresholds for development scale and change in vehicle movements to determine whether an air quality assessment is required and therefore this addendum has also applied that guidance.

10.12 Both the methodologies for emissions from the EfW and MBT and for emissions from vehicles adopt a staged approach, commencing with screening of the potential effects to determine whether the potential air quality effect may be significant and therefore require more detailed assessment, or insignificant such that they will have negligible effect and no further assessment is required.

Legislation

10.13 As in 2014, the air quality objectives adopted in the UK and limit values remain effectively as per the Air Quality Strategy for England, Scotland, Wales and Northern Ireland, published on 17th July 2007 and those which are limit values required by EU Daughter Directives on Air Quality were transposed into UK law through the Air Quality Standards Regulations (Northern Ireland) 2010.

10.14 The Government has been clear that it has no plans to change limit values and target air quality following the UK's withdrawal from the EU (Ref. Parliamentary Business – Pollution Control: Written question – 120393¹). Further discussion is provided in the 'House of Commons Library – Briefing Paper Number CBP8195, 10 October 2018, Brexit and air quality'.

Emission Standards

10.15 The air quality assessment is based upon comparison of the baseline local air quality (current and projected without the development proposals) at the application site to the air quality impacts predicted to result from the proposed development.

Baseline Conditions

Application Site Details and Topography

10.16 No change has been identified which could necessitate updating the ground model used for the dispersion modelling.

Meteorological Conditions

¹ <https://www.parliament.uk/written-questions-answers-statements/written-question/commons/2017-12-19/120393>

10.17 Historical hourly sequential meteorological data for 2004–2012 for Belfast International Airport was utilised and the conclusion remains valid that based on the sensitivity analysis the use of meteorological data for the years 2004 to 2012 from Belfast (Aldergrove) International Airport provides a robust overall basis for the interpretation carried out in the air quality assessment. The conclusions are effectively drawn from evaluation nine years of meteorological data with 78,922 predictions (the period excludes 160 missing hours from 2004 to 2012), which for statistical predictions is more than required by Government guidance² which currently recommends the use of five years of meteorological data and not less than three years of meteorological data when dispersion modelling.

Potential Receptors – Human and Ecological

10.18 No change has been identified.

Local Air Quality Management

10.19 Due to the changes in the local council boundaries since 2014, the existing local air quality has been considered with reference to the Antrim and Newtownabbey Borough Council and Belfast City Council latest air quality management reports, namely the 2018 Updating and Screening Assessment for Antrim and Newtownabbey Borough Council, July 2018, and the 2018 Air Quality Updating and Screening Assessment for Belfast City Council, July 2018.

10.20 Those reports indicate that most of the Air Quality Management Areas previously declared by Newtownabbey Borough Council have been revoked, an exception being the Antrim and Newtownabbey Borough Council AQMA at Elmfield which is approximately 3km from the proposed MBT and EfW plant. The closest Belfast City Council AQMA is still that along the M1 / Westlink corridor which is 7 km from the application site. Neither of those AQMA's is likely to be affected by emissions at the application site.

Existing Air Quality

Air Quality Monitoring Data

10.21 Air quality monitoring specifically for nitrogen dioxide and sulphur dioxide using Gradko diffusion tubes at selected locations near the Hightown Quarry site was carried out for a limited duration from June/July 2013 to June/July 2014 to provide indicative local data. Initial monitoring results from four sampling periods were presented in 2014 but the monitoring continued to complete a year of sampling. That data is summarised in the following table.

² <https://www.gov.uk/guidance/environmental-permitting-air-dispersion-modelling-reports#explain-your-report>

Table 10.1 Local Air Quality Monitoring Data (updated 2019)

Sample Location	Coordinates	No. of Sampling Results		Nitrogen Dioxide (NO ₂) µg/m ³		Sulphur Dioxide (SO ₂) µg/m ³	
		NO ₂	SO ₂	Mean	SD	Mean	SD
Squires Hill	330219, 378981	12	13	7.8	1.6	8.6	7.0
Flush Road (bridge)	329099, 379206	11	12	7.9	2.4	2.8	1.9
Flush Road (field)	328390, 380520	12	13	6.3	1.4	1.5	1.1
Boghill Road	328976, 381234	12	13	6.9	1.8	1.5	1.2
62 Upper Hightown Road	330157, 380093	12	13	6.7	1.9	3.9	3.8
Hightown Road	330387, 381091	12	13	11.3	3.0	2.6	1.1
<p>Note: Sampling was carried monthly for 13 months. Missing sample results are due to problems with the diffusion tube analysis. SD – standard deviation.</p>							

10.22 The monitoring results are slightly higher than indicated for the Hightown Quarry vicinity from review of the available sources of data, but as the results are well below applicable air quality standards further monitoring was not carried out.

Background Data Values Used for the Assessment including for Acidification and Nutrient Enrichment

10.23 A review of the background concentrations utilised for the assessment in 2014 has been carried out to check those for the new planned year of opening of 2023. Background

concentrations utilised for the assessment include those sourced from the latest monitoring data for the Belfast Centre AURN Site 103, and predicted future background air quality values available via the UK Air Information Resource Data Archive (<https://uk-air.defra.gov.uk/data/>), and deposition data available via the CEH UK Deposition Data (<http://www.pollutantdeposition.ceh.ac.uk/data>). For acidification and nutrient enrichment critical and current loads have been checked via the Air Pollution Information System (APIS <http://www.apis.ac.uk>).

10.24 In general terms the latest background values available mainly show slightly lower background concentrations i.e. a slight improvement in background air quality. The implications are assessed later wherever the air quality assessment necessitates evaluation of a predicted environmental contribution (PEC) i.e. the process contribution (substance emission) plus the background concentration, or of the process contribution to background concentrations at potential ecological receptors where acidification due to nitrogen or sulphur or deposition of nitrogen is relevant. For lower background concentrations the predicted environmental contribution as a percentage of the assessment criterion will reduce slightly compared to 2014, whereas for substance load to habitats the process contribution as a percentage of the background concentration will increase compared to 2014.

Predicted Environmental Effects and their Significance

Air Quality Impact Due to Substance Emissions

10.25 As indicated earlier the appraisal methodology applied in 2014 remains the appropriate approach.

Emissions

10.26 There is no change to the design parameters and emissions rates for the EfW and MBT, hence the process contributions predicted by the air dispersion model are unchanged.

10.27 The Industrial Emissions Directive (IED) is the main EU instrument regulating substance emissions from industrial installations and hence the IED emission limit values still apply.

Dispersion Model

10.28 For the air quality assessment the predictive dispersion modelling has been carried out using two separate models, AERMOD and ADMS. Those dispersion models remain valid although later versions have been released since 2014. AERMOD is now at version 18081, AERMET is at version 18081, and ADMS is now at version 5.2.2 October 2017 and incorporates plume visibility. The software revisions entail minor bug corrections and model enhancements and consequently it is not expected that model predictions from the latest software versions would differ substantially from the software versions used for the 2014 Air Quality Assessment, given also that the modelling appraised nine years of hourly meteorological data and carried out sensitivity analysis as presented in the ES Appendices 14.3 and 14.8.

10.29 Therefore it is considered unnecessary to rerun the dispersion models though it is acknowledged the use of later versions of the software would be likely to produce very slightly different process contribution values. However the use of the maximum process contributions determined from the modelling of nine years of hourly meteorological data is considered to provide an appropriate approach for the assessment of the potential effect on air quality of the development proposal.

AERMOD dispersion Model Predictions – Normal Operations of EfW

Long Term Emission Rates

10.30 There is no change in the background values used for cadmium and arsenic, and only a slight reduction for nickel (from 0.00075 to 0.00067 $\mu\text{g}/\text{m}^3$) for which predicted environmental contributions are calculated. Hence for those substances the PEC, which for nickel reduces from 0.0021 to 0.00197 $\mu\text{g}/\text{m}^3$ (10.3% down to 9.85% of the assessment criterion), remains well below each substance's respective long-term assessment criterion.

Short Term Emission Rates

10.31 There is slight reduction in the 2023 background value for sulphur dioxide for which predicted environmental contributions are calculated, hence the PEC improves slightly and so no further assessment for sulphur dioxide is necessary.

10.32 There is slight increase in the 2023 background value for nitrogen dioxide for which predicted environmental contributions are calculated, but the PEC remains well below the relevant short-term assessment criterion so further assessment is unnecessary.

10.33 A table showing the dispersion model predictions for short term impact by direct inhalation for sulphur dioxide and nitrogen dioxide presented in 2014 assessment and with updated background and PEC values is provided in Appendix 10.1.

Assessment of Emissions of Dioxins and Furans

10.34 Air concentrations of dioxins and furans are recognised as an insignificant route of exposure via the respiratory route for humans to these substances and no standards for dioxins and furans in air have been set.

10.35 Dioxins and furans have been assessed (together with toxic metals), in terms of overall intake, including both inhalation and the potential for the more significant exposure route of ingestion, via a human health risk assessment which is provided as ES Appendix 14.9. That assessment evaluated the potential for a health risk to humans from possible exposure to emissions to air from the proposed EfW of substances which may persist and accumulate in the environment, and which may potentially cause adverse health effects through long term cumulative exposure. As that human health risk assessment methodology considers the process contributions only and not in combination with background concentrations that study does not need reconsideration and its conclusions remain applicable for the proposed development.

AERMOD Dispersion Model Predictions – Vegetation and Ecosystems

Direct Effect of Substances in the Air

- 10.36 There is slight increase in the 2023 background value for nitrogen dioxide for which predicted environmental contributions are calculated, but the PEC remains well below the relevant short-term assessment criterion so further assessment is not necessary.
- 10.37 A table showing the dispersion model predictions for the screening of impact on vegetation and ecosystems of emissions to air for the nitrogen dioxide values presented in 2014 assessment and with updated background and PEC values is provided in Appendix 10.2.

Acidification

- 10.38 Using the updated critical load values for nitrogen and sulphur the predicted process contribution towards acid deposition is less than 1% of the critical load at most of the conservation sites and so the potential for acid deposition can be screened out as insignificant at those conservation sites.
- 10.39 The exception is Belfast Hills – Squires Hill SLNCl where for the central location utilised in the assessment in 2014 the critical load for sulphur CL_{maxS} for 'dwarf shrub heath' habitat is now lower at 0.46 keq/ha/yr as a three year average for 2013-2015, compared to 0.87 keq/ha/yr for the three year average 2009-2011. Consequently the process contribution as a percentage of CL_{maxS} becomes slightly higher at 1.5% which slightly exceeds 1% compared to the 0.78% reported in the 2014 assessment. With the addition of the process contribution to the current sulphur load (0.32 keq/ha/yr for 2013 - 2015 compared to 0.23 keq/ha/yr in 2011) the predicted environmental contribution as a percentage of the critical load is 71%. However at the western location 1.3km to the west also previously utilised in the 2014 assessment the CL_{maxS} value is similar to previous (1.61-1.62 keq/ha/yr) and the process contribution as a percentage of CL_{maxS} is much lower at 0.13%, though sulphur deposition is also reported to have increased slightly at that location as at the central location (0.32 keq/ha/yr for 2013 - 2015 compared to 0.23 keq/ha/yr in 2011).
- 10.40 The Belfast Hills Partnership area takes in Carnmoney Hill and Cave Hill to the north and Colin Glen, Divis and Black Mountain and Slievenacloy to the west and the operational boundary encompasses 4,400 hectares within which there are several SLNCl including the Squires Hill SLNCl of heath, grassland and scrub, which occupies approximately 115ha. The lower critical load for sulphur CL_{maxS} for 'dwarf shrub heath' habitat applies to the eastern half of the SLNCl, whereas the dispersion model results indicate it would be localised at the Squires Hill summit where the highest sulphur concentrations could occur within the SLNCl, though as shown by the 2014 assessment the sulphur dioxide concentrations would be well below the environmental action level for the protection of ecosystems and vegetation.

Nutrient Enrichment

10.41 With regard to potential nitrogen deposition at ecological receptors the relevant critical loads for the habitat types associated with each designated site have been checked via the UK Air Pollution Information System (APIS) website and no changes identified. Therefore as concluded in 2014 the predicted process contributions towards nutrient enrichment by nitrogen deposition is less than 1% of the critical load at each site, the potential for nutrient enrichment by nitrogen deposition can be screened out as insignificant.

Smothering by Deposited Dust

10.42 The process contributions and assessment criteria are unchanged hence as concluded in 2014 the potential level of deposition is considered to be insignificant with regard to smothering.

Deposition of Persistent Substances

10.43 The assessment criteria as maximum allowed deposition rates are unchanged for the substances assessed in 2014 so further assessment is not required.

Dispersion Model Predictions – Abnormal Operations

10.44 The small changes identified for the predicted background concentrations of some substances in the opening year of 2023 has not affected the assessment conclusion that there will be no adverse impact from short term or long term air quality from abnormal operation if it occurs.

AERMOD Dispersion Model Predictions – MBT

10.45 The background concentrations of PM10 and ammonia are ascertained to be slightly lower than utilised 2018 and so that slightly improves the PEC, hence the conclusions in 2014 are unchanged and further assessment is not necessary.

In Combination Emissions from MBT with EfW

10.46 Maximum process contributions due to emissions from MBT are located much nearer to the application site than for emissions from the EfW and have not changed and are effectively assessed in the ES Chapter 14 for receptors such as dwellings and habitat sites so no further consideration is required.

Air Quality Impact due to Odour Emissions

10.47 The Environment Agency's Technical Guidance Note H4 Odour Management – How to comply with your environmental permit, April 2011, is still relevant current guidance. The ES Chapter 14 assesses the potential for odour and its dispersion from the application site based on the predicted absolute odour levels at nearby receptors due to emissions from the MBT compared to relevant benchmarks.

10.48 The conclusion of the 2014 assessment regarding odour remains valid, namely that potential odour emissions from the MBT with the proposed exhaust air treatment system are unlikely to

cause annoyance complaints from the nearby residents. For the design odour emission target, the predictions indicate that in adverse meteorological conditions there could on occasions be a faint and potentially recognisable odour within the application site and locally at the application site boundary to the south east of the MBT.

Air Quality Impact due to Bioaerosols

10.49 As for the assessment of potential odour, the ES Chapter 14 assesses the potential for bioaerosols and their dispersion from the application site based on the predicted absolute bioaerosol levels at nearby receptors due to emissions from the MBT compared to relevant benchmarks. Background concentrations of bioaerosols are not relevant within the assessment methodology and therefore the conclusion of the 2014 assessment remains valid.

ADMS Dispersion Model Predictions – EfW Plume Visibility

10.50 ADMS is a Gaussian plume air dispersion model produced by the Cambridge Environmental Research Consultants which includes a plume visibility module from which results for the EfW and MBT are provided in the ES Appendix 14.8. That dispersion model remains valid as reported in the 2014 ES.

Air Quality Impact due to Operational Traffic

10.51 Appraisal of the latest vehicle movement predictions for the Transport Assessment (see Chapter 8) indicates that for the application site opening year 2023 the effect on local roads Boghill Road, HydePark Road, Hightown Road, Mallusk Road and Scullions Road, is predicted to be an increase in AADT of 118 (Scullions Road) to 246 (Boghill Road) vehicles of which HGV would be 72 (Scullions Road) to 126 (Boghill Road) as summarised in the table in Appendix 10.3 in this addendum.

10.52 With reference to the DMRB Volume 11 Environmental Assessment Section 3 Environmental Assessment Techniques Part 1 HA 207/07 Air Quality guidance those predicted change in traffic flows due to the development do not exceed the screening criteria of daily traffic flows changing by 1,000 AADT or HDV flows changing by 200 AADT or more. The other criteria for change in daily average speed or peak hour speed or road alignment change are also not exceeded. Therefore based on the DMRB guidance it is not necessary to undertake calculations to assess the potential effect on local air quality.

10.53 The IAQM guidance 'Planning for Air Quality' in relation to air quality from vehicle emissions sets out two stage screening criteria to identify whether an air quality assessment is required, which mainly depends on the scale of proposed development (Stage 1) and changes in traffic flows or roads anticipated (Stage 2). The criteria provided are precautionary and to be treated as indicative with an intended function as a sensitive 'trigger' for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. Where an air quality assessment is identified as being required, this may be either a Simple or a Detailed Assessment. A Simple Assessment is one relying on already published information and without quantification of impacts, in contrast to a Detailed Assessment that is completed with the aid of

a predictive technique, such as a dispersion model. The use of a Simple Assessment may be appropriate, where it will clearly suffice for the purposes of reaching a conclusion on the significance of effects on local air quality.

10.54 The IAQM guidance also includes an approach for assigning descriptive terms to the potential impacts based upon the magnitude of incremental change as a proportion of a relevant assessment level, such as an air quality objective level, and then to examine this change in the context of the new total concentration and its relationship with the assessment criterion.

10.55 Many of the criteria within the IAQM Guidance Stage 2, such as traffic flows or change in road alignment, are similar to those in the guidance provided in the DMRB Volume 11, Section 3 Environmental Assessment Techniques, Part 1, HA 207/07 Air Quality, which has formal status for the assessment of the impact that road projects may have on local or regional air quality. However the criteria in the IAQM guidance are more stringent, reflecting the potential for local area implications, particularly within or near an AQMA, even though for example there will be uncertainty in the prediction of air quality effects due to small changes in future traffic flows.

10.56 With reference to the IAQM guidance, the Stage 1 criteria to proceed to Stage 2 are exceeded for the application site due to the scale of the proposed development. For the Stage 2 'Indicative Criteria to Proceed to an Air Quality Assessment' the change in Light Duty Vehicles (LDV) is below the applicable 500 AADT threshold but the change in Heavy Duty Vehicle (HDV) criteria of 100 AADT is exceeded slightly. Other Stage 2 criteria are not exceeded.

10.57 The change in traffic flows summarised in the table in Appendix 10.2 indicate the nearest road links: Boghill Road off the Hydepark Road, Hydepark Road between Boghill Road and Hightown Road at Boghill junction, and between between Boghill Road and Hightown Road at Hightown junction will in 2023 experience more than a doubling of HGV compared to that predicted for 2023 without the proposed development, whereas further afield the proportional increase in HGV will be less than 40% from that predicted without the proposed development in 2023.

10.58 However background concentrations of nitrogen dioxide and PM10 for the roads which will experience a change in HGV traffic are forecast to be well below their respective annual air quality limit values in the opening year 2023 as summarised in the following table.

Table 10.2 Projected Background Air Quality near Roads with Predicted Traffic Change

Link No	Speed Limits (mph)	Link		Projection for 2023		
		Description	Indicative Mid Point Grid Reference	Kilometre square centre grid reference	Nitrogen dioxide µg/m3	PM10 µg/m3
1	60	Boghill Road off the Hydepark Road – passes though rural land with occasional nearby dwellings.	329490, 381291	329500, 381500	8.3	9.6
2	60	Hydepark Road between Boghill Road and Hightown Road at Boghill junction – western perimeter of Hyde Park with no dwellings near the link.	330087, 381420	330500, 381500	11.2	13.2
2a	60	Hydepark Road between Boghill Road and Hightown Road at Hightown junction - western perimeter of Hyde Park with no dwellings east of the link.				
3	40	Hightown Road between Hydepark Road and Mallusk Road at Hightown junction – dwellings to the north and south of the link but wide verge along some sections.	330827, 381642	330500, 381500	11.2	13.2
3a	40	Hightown Road between Hydepark Road and Mallusk Road at Mallusk junction – link mainly has undeveloped land to the north and south with				

Link No	Speed Limits (mph)	Link		Projection for 2023		
		Description	Indicative Mid Point Grid Reference	Kilometre square centre grid reference	Nitrogen dioxide µg/m3	PM10 µg/m3
		a few dwellings to south at east end near the junction.				
4	40	Mallusk Road between Scullions Road and Hightown Road at Hightown junction				
4a	40	Mallusk Road between Scullions Road and Hightown Road at Scullions junction – mainly commercial land use north and south, no apparent dwellings nearby.	330696, 382298	330500, 382500	13.4	12.9
5	40	Scullions Road between Mallusk Road and M2 Motorway - mainly commercial land to the west and east, no apparent dwellings nearby.	330269, 382718	330500, 382500	13.4	12.9
Notes:						
1. Projections are sourced from www.airquality.co.uk .						

10.59 For the identified road links with potential traffic changes it is mainly the west end of Hightown Road, i.e. Link 3 Hightown Road between Hyde Park Road and Mallusk Road at Hightown junction, where dwellings are near a road, but generally the road links are 'open' in character rather than narrow and flanked by buildings on both sides forming 'urban canyons'. Therefore vehicle emissions are likely to disperse well rather than become concentrated, except perhaps transiently during traffic jams or when there is no wind, i.e. calm air.

10.60 Air quality effects due to vehicles are mainly due to emissions from HGV and small changes in LGV normally only have a small effect unless local conditions dictate otherwise. If it is assumed for a conservative assessment that the nitrogen dioxide and PM10 concentrations are solely a function of the HGV and that the increase in HGV would lead to a proportional increase in the

local concentrations of nitrogen dioxide and PM10, then by inspection of Table A14.1 it can be seen that the concentrations of nitrogen dioxide and PM10 will over the wider area remain well below their respective air quality limit values.

10.61 In actuality a change in air quality would occur close to the roads but with the 'open' character of the road links with potential traffic changes air dispersion will occur. Hence based on this simple assessment and given the DMRB threshold criteria for HGV are not exceeded it is considered that further, more detailed quantitative assessment is not required.

10.62 In qualitative terms and although there have been previous vehicle movements to and from the quarry, at most a marginal deterioration in the existing local air quality may occur due to the traffic travelling to and from the proposed development.

Predicted Environmental Effects and their Significance

10.63 Based on the appraisal within this Addendum the conclusions within the ES Chapter 14 regarding predicted environment effects and their significance for air quality remain applicable and are not affected by factors relevant to the assessment of air quality which have been identified to have changed since 2014.

Overall Conclusion

10.64 The key findings in 2014 remain valid and are not affected by factors relevant to the assessment of air quality which have been identified to have changed since 2014.