23rd March 2021

By Registered Post

Kerry County Council
Environmental Services
Maine Street
Tralee
Co. Kerry

Our Ref: 501-00180-00309
Your Ref: Kerry File Ref. AP-20-01

Dear Sir / Madam,

RE: LICENSING OF INDUSTRIAL PLANT (AP-20-01)

RESPONSE TO REQUEST FOR CLARIFICATION OF FURTHER INFORMATION

SLR Consulting, Unit 7 Dundrum Business Park, Windy Arbour, Dublin 14 act as Planning & Environmental advisors to Roadstone Ltd..

We refer to Kerry County Council's letter dated the 18th February 2021 (Ref. No. AP-20-01) and provide our response in Appendix CFI 1 to the requested items of clarification of further information.

Yours sincerely
SLR Consulting Ireland

Peter Kinghan

Peter Kinghan
Technical Director

Enc: Appendices
cc. Pat Gibney (Roadstone Ltd.)

APPENDICES

Appendix CFI 1

APPLICATION FOR AN AIR EMISSIONS LICENCE

(AP-20-01: REQUEST FOR CLARIFICATION OF FURTHER INFORMATION)

PROPOSED ASPHALT PLANT

ROADSTONE LTD.
CLASHEEN
KILLARNEY, CO. KERRY

ENVIROCON

Air Pollution and Environmental Consultancy

APPLICATION FOR AN AIR EMISSIONS LICENCE

(AP-20-01: REQUEST FOR CLARIFICATION OF FURTHER INFORMATION)

PROPOSED ASHPALT PLANT

CLASHEEN, KILLARNEY
CO. KERRY

ROADSTONE LTD.
CLASHEEN
KILLARNEY, CO. KERRY

Client	SLR Consulting Ltd.
Address	Dundrum Business Park, Dublin 14
Version	Final
Circulation	Peter Kinghan
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	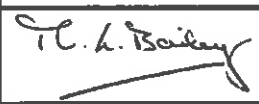
Date	22/03/2021

ITEM 1:

You are requested to submit an amended Appropriate Assessment Screening Report (by way of an AA Screening addendum report or otherwise) clarifying the following:-

- *Please clarify how the Nitrogen Deposition target of 5kg N/ha/yr for Sheheree (Ardagh) Bog SAC, as outlined in the Conservation Objectives for that SAC, would be impacted by the proposal, if at all. As part of this, you are requested to note that the Conservation Objectives document outlines that the measure for Nitrogen Deposition assessment as it relates to the Sheheree (Ardagh) Bog SAC is kg N/ha/year and accordingly this is the measure which should be used in the Appropriate Assessment Screening report.*
- *Address within the cumulative effects considerations, that Nitrogen deposition rates within Sheheree (Ardagh) Bog SAC may currently exceed the 5kg N/ha/yr target as outlined in the notes accompanying 'Air Quality Nitrogen Deposition,' in the Conservation Objective report for the SAC. Additional cumulative sources of nitrogen deposition on the Bog should also be taken into consideration such as those possibly arising from transport and agriculture.*
- *Confirm that no measures are proposed which are intended to reduce or avoid impact on Sheheree (Ardagh) Bog SAC or any other Natura 2000 sites.*

Response

This AA Screening addendum report has been prepared by Envirocon, with input from SLR Consulting.

1.0 Pollutant deposition processes

There are 2 main pathways by which gases and aerosols are removed from the atmosphere; dry deposition close to the emission source and wet deposition which is primarily associated with removal by precipitation. Dry deposition is associated with emissions from industrial or power generating installations with removal of NO_x and SO_2 from the plume as it travels downwind with the gases removed by gravity and the aerosols land on vegetation where the exposed leaves adsorb the air pollutants. The process is caused by turbulent diffusion within the lower air layers above the ground and is related to the concentration of the gas and the deposition velocity. The removal process is especially important for ammonia emissions emitted from farming livestock, especially from dairy cattle herds, and to a lesser extent from slurry spreading.

Wet deposition removal is associated with trans-boundary emissions, originating from emissions at power stations and large industries with the emission plume being incorporated and converted into secondary pollutant aerosols of nitrate and sulphate, within cloud-water. These aerosols are transported many 100's or even 1000's of kilometres as trans-boundary emissions before falling from clouds as acid deposition. This process is known as rain-out of secondary pollutant aerosols. A second process may also occur with wet deposition of NO_x emissions from below the cloud base by precipitation, a process known as wash-out. This is only significant downwind of major emission sources such as large industrial areas or power stations. Wet deposition is the principal deposition pathway in upland areas due to high rates of rainfall and direct transfer of cloud-water droplets to vegetation when low cloud persists over high ground.

The total deposition load of Nitrogen and Sulphur at ecologically sensitive sites is the sum of dry and wet deposition. Deposition of total nitrogen (N) can be as oxidised nitrogen (NO, NO_2, N_2O and as NO_3 nitrate aerosol) and as reduced N (RedN) (NH_3 and NH_4). Sulphur deposition occurs as gaseous SO_2 and also as secondary SO_4 sulphate aerosol.

In County Kerry, the principal deposition pathway for oxidised N and S is by dry deposition compared to wet deposition, especially where the emission source is close to the ecologically sensitive area. In the case of RedN, over 90% of NH_3 is deposited as dry deposition within a few kilometres of where emissions from farming activities occur.

2.0 Air Quality Model Impact Evaluation

An air quality modelling study using the ADMS5[1] advanced model was undertaken to evaluate the potential impact of emissions in the area from the proposed asphalt plant at Clasheen as part of the Air Emissions Licence application. This report by Envirocon[2] detailed the methodology and input and output parameters of the ADMS5, including a section on potential air concentration impacts at ecological sensitive sites (Section 5.4), including Sheheree Bog SAC.

The Environmental Protection Agency in Ireland (Environmental Management in the Extractive Industry (non-scheduled minerals): Environmental Management Guidelines (2006)) recommend the following Emission Limit Values for emissions to air arising from asphalt plants regulated under the Air Pollution Act, 1987: • Sulphur dioxide 500 mg/Nm3 • Nitrogen oxide 450 mg/Nm3 • Dust 50 mg/Nm3.

The predicted NO_x and SO_2 annual ambient concentrations in the locality of Sheheree Bog SAC, approximately 2.8km to the west of the asphalt plant are shown in Figure 1 and 2, as ground level concentration contour plots. These values are the potential effects due to maximum emissions from the asphalt plant exhaust stack on air quality at the SAC, ie. the Process Contribution (PC). The results demonstrate that compared to the ambient critical level for NO_x specified in the National Air Quality Standards (NAQS)[3] of 30 $\mu g/m^3$ for the protection of vegetation, the maximum long-term impact near the SAC is <0.5% of the limit value specified in the NAQS. The corresponding maximum predicted annual SO_2 concentration is also <1% of the annual critical level of 10 $\mu g/m^3$ applied to lichens, mosses and other raised bog plant species (IAQM)[4].

Figure 1: Predicted annual average NO_x concentrations in the locality of Sheheree Bog due to maximum emissions from the asphalt plant. (µg/m³)

In order to confirm that predicted annual nitrogen deposition rates in the locality of the SAC will also be very low, the ADMS5 model was run to predict annual Nitrogen deposition rates due to maximum NO_x emissions from the plant exhaust stack. The NO_x annual deposition rate is given as kg of Nitrogen (N) per hectare (kgN/ha/yr) (Figure 3). The rate of deposition is related to the concentration in the plume and dry deposition velocity of NO_2, since deposition of NO will be negligible within this distance downwind.

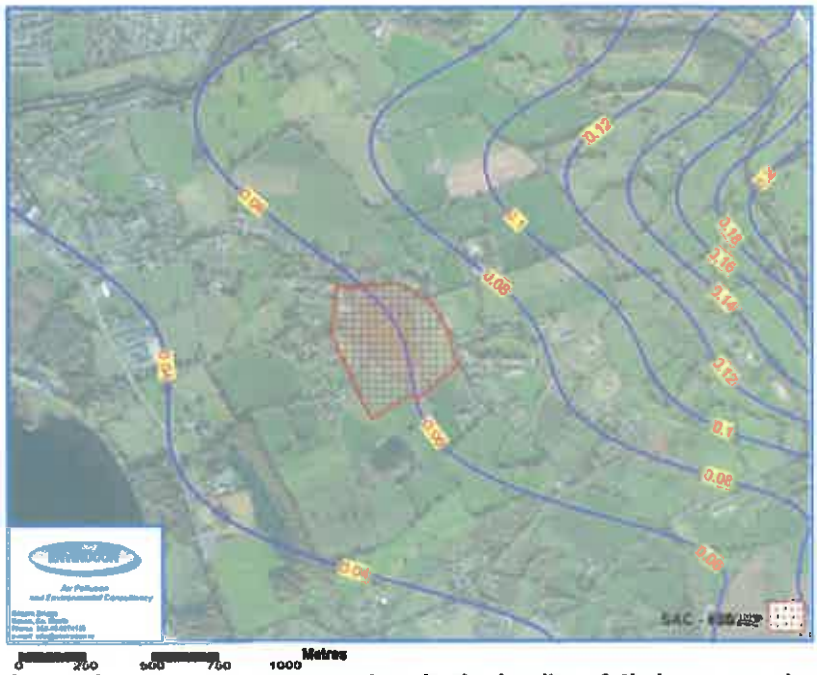

Figure 2: Predicted annual average SO_2 concentrations in the locality of Sheheree Bog due to maximum emissions from the asphalt plant. (µg/m³)

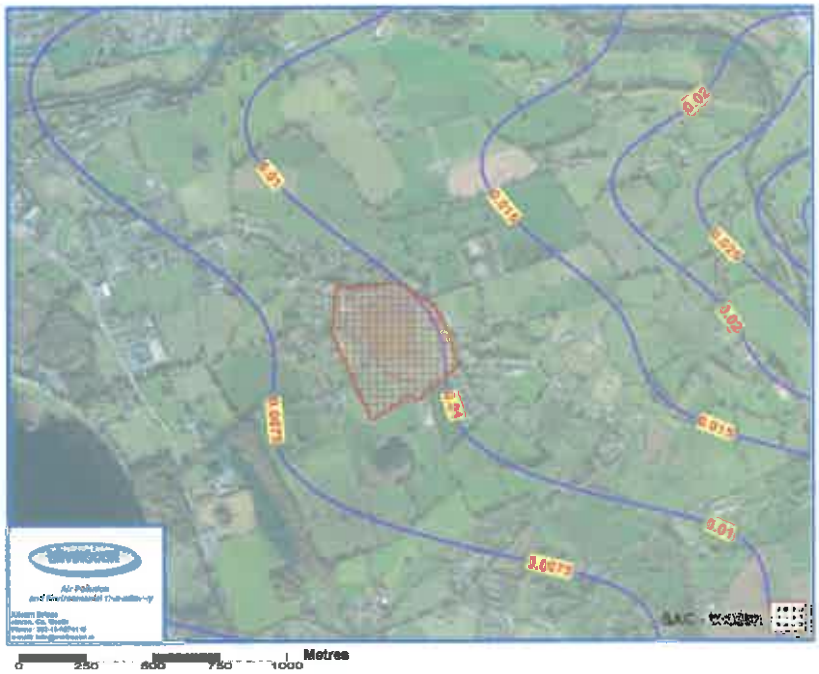

Figure 3: Predicted annual N deposition rates in the locality of Sheheree Bog due to emissions from the asphalt plant. (kgN/ha/yr)

The predicted rate of 0.01 kg N/ha/yr is 0.2% of the lower critical load conservation target of 5 kg N/ha/yr specified for Sheheree Bog by the National Parks and Wildlife Service (NPWS). The critical load relates to the long-term potential effects of pollutant deposition and is defined as *"a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge"*. An increment of 1% or less of the relevant annual critical load alone is considered inconsequential (IAQM 2019).

The European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL)[5] set the *de minimis* value for contributions to dry deposition of nitrogen at 0.3 kg/ha/yr. The IMPEL guidance states, below this deposition rate contributions *"cannot be realistically attributed to a particular project they should rather be described as diffuse part of the background deposition"*. Both thresholds above are very low and thus in line with the precautionary approach prescribed by the Habitats Directive.

As such the level of ambient change in annual N deposition associated with the proposed asphalt plant is not likely to be discernible from ambient measurements or fluctuations in the background annual rate.

3.0 Critical Load Objective

3.1 Conservation Objective for Sheheree SAC (NPWS)

The range in the annual Nitrogen deposition target of 5 kgN/ha/yr is the lower limit of the critical load value appropriate for raised bogs that is given in the conservation objectives (CObj) of between 5-10 kgN/ha/yr for Sheheree SAC. This range, as a target objective, was developed in

2011 and was standard throughout Europe irrespective of differences of climatic zone. However, the appropriate target value for annual rate of N deposition for ecologically sensitive areas is also associated with whether the site is within a region of high or low rainfall. In the CObj support document available on the NPWS web-site the approach in selecting an appropriate critical load value relevant to annual rainfall occurring at the SAC site is mentioned. The CObj support document states that the critical load at the high end of the range of 5-10 kgN/ha/yr should be applied to the Sheheree Bog SAC. However, the precautionary approach in the air quality (N deposition) objective adopted the site-specific target of the air quality surrounding the bog close to natural reference conditions with total annual N deposition rate of 5 kgN/ha/yr.

3.2 Interpretation of Conservation Objective values

The Conservation Objectives for the Sheheree SAC gives a rate of N deposition above the upper critical load value of 11.4 kgN/ha/yr, with a reference to the Henry & Aherne [6] study. This study derived spatial estimates of total N deposition in Ireland to determine the extent and magnitude of exceedance of critical loads and Natura 2000 protected grasslands. The approach was to disaggregate estimates of annual oxidised nitrogen (as N) and reduced N (ammonia (NH_3) deposition based on the European EMEP[7] data for Ireland. Prior to 2016, the EMEP programme modelled total annual N deposition rates using a spatial grid size of 50km x 50km and H&A2014 disaggregated these to 5km x 5km grid squares to estimate the local N impacts. In addition, they used long-term annual precipitation data from Valentia and applied the rates and precipitation chemistry within these grid squares. Annual N deposition rates across the whole of Ireland were then calculated.

Their approach used macro-scale atmospheric chemistry modelling to calculate micro-scale N deposition impacts. Such an approach should be viewed with caution in using specific N deposition values for small areas. This is especially the case where the total area of interest, such as the Sheheree bog locality is substantially less than 25km^2.

Furthermore, from a review of the Henry & Aherne 2014 publication, there is no detail on how the critical load of 11.4 kg/h/y value for Sheheree Bog was calculated. Other SAC data for bogs available on the NWPS web-site give a wide variation in values, such as Ardriague Bog SAC (SAC002356)[8] near Banagher gives a value in the Conservation Objectives for this raised bog of 12.3 kgN/ha/yr and Tullaghanrock Bog SAC (SAC002354)[9] near Ballinhadereen gives a corresponding CObj value of 8.4 kgN/ha/yr. The calculations of annual N deposition at various sites in Ireland are given in the Conservation Objectives that references the Henry & Aherne 2014 study. These data-sets with this degree of accuracy in deposition rates are not available and so it is not possible to confirm how such rates were calculated from the study.

However, such accuracy is not possible based on the limitations of the EMEP model, limited spatial accuracy of land-use, emissions, atmospheric chemistry and in the case of ammonia emission impacts, live-stock densities and farming practices. It should be noted that even the latest EMEP modelling reports of annual N deposition rates give ranges in mapping results of annual deposition rates equivalent to 5-10 KgN/ha for the lower deposition categories with a range width of >50 KgN/ha for higher deposition categories.

The Conservation Objectives supporting documents for SACs for bogs that were reviewed on the NWPS web-site included the following paragraphs:-

The critical load applied to peatland ecosystems by Aherne & Farrell (2000) was 10kg N/ha/yr. This is in line with the recommendation by Bobbink & Hettelingh (2011) that the critical load should be set at the high end of the range in areas of high precipitation and at the low end of the range in areas of low precipitation assuming that Ireland represents a high precipitation area.

It is recommended in the case of Sheheree Bog that the level of N deposition should not exceed the low end of the range i.e. 5kg N/ha/yr. This recommendation is based on a precautionary approach, as the evidential basis for setting a higher level is not particularly strong as alluded to by Payne (2014). Total N deposition in the vicinity of Sheheree Bog as reported by Henry & Aherne (2014) is 11.4kg N/ha/yr.

The first paragraph mentions setting the critical load at the high end of the range as the Killarney area is within a high precipitation area. However, it is the final paragraph that dismisses this approach in recommending the lower end of the range, ie. 5 kgN/ha/yr should be used in Ireland for raised bogs. The adoption of a precautionary approach references a UK based report by Payne (2014)[10]. This was a study of the exposure of British peatlands to nitrogen deposition based on atmospheric chemistry studies undertaken during the 1990s-mid 2000s. These studies were related to conditions where significant deposition of both S and N were occurring in upland areas of England, with much of the deposition taking place as acid rain from sulphate aerosol. Wet N deposition was due to emissions from both the major power stations and other large industries as well as trans-boundary sources in the major industrial areas of Europe. This resulted in N deposition at a number of peat bogs well above the upper critical load of 10 kgN/ha/yr with rates of 15 kgN/ha/y in many locations where sensitive bog species were present.

This serious deposition scenario for the UK in the Payne report is not representative of patterns occurring in Ireland, especially in western counties, where the prevailing weather is due to westerly Atlantic cyclonic systems with associated high rates of precipitation. This synoptic weather pattern results in much lower rates of N wet deposition rates and therefore deposition loading in ecologically sensitive areas compared to the situation prevailing 10-20 years ago in the UK. The impact of emissions from power stations and large industries was of an order of magnitude greater compared to the major emission sources in Ireland. For example, emissions during the 1990's from just one power station in the UK Midlands was greater than the total NO_x emitted from all sources in Ireland.

3.3 Annual N deposition update

The Conservation Objectives for the Sheheree SAC gives a rate of N deposition above the upper critical load value of 11.4 kgN/ha/yr, with a reference to the Henry & Ahearne 2014 study. However, more recent results from modelling emissions and atmospheric chemistry using 2018 data are available. The 2020 report available from EMEP[11] provide statistics on emission and deposition rates for annual oxidised N, RedN and S in Ireland for 2018. These are presented as maps of annual deposition rates based on a fine-scale gridding for modelling the contribution of emissions from Ireland to N deposition and also trans-boundary contributions to the total annual deposition. These maps include results for N and reduced N (NH_3) deposition. The trend since

2000 in terms of annual oxidised N deposition is a reduction from 21,000 tonnes in 2000 by 38% to 13,000 tonnes in 2018. In comparison, the trend in NH_3 emissions shows a very small change in NH_3 emissions over these years, increasing by 2% from 42,000 tonnes in 2000 to 43,000 tonnes in 2018.

Since the primary source of NH_3 deposition in Ireland is attributed to agricultural emissions with insignificant levels from burning fossil fuels it is evident that control of emissions from this sector is the main factor in reducing potential long-term total N deposition impacts at raised bogs in Ireland. Furthermore, the results from the 2020 EMEP report indicate that annual oxidised N deposition in the Kerry area is estimated at 1-2 kgN/ha/yr, with trans-boundary N wet deposition approximately 60-70% of the annual deposition. In terms of annual RedN deposition rates, the annual rate is estimated at about 2-3 kgN/ha/yr, with below 20% from trans-boundary sources.

This estimate for annual total N deposition is significantly lower than the 11.4 kgN/ha/y referenced in the NPWS conservation objectives for Sheheree bog SAC.

3.4 Cumulative Impact

The main pollutants from traffic emissions which are of concern for ecology are nitrogen oxides (NOx), together with the acidification and eutrophication associated with acid and nitrogen deposition on sensitive ecosystems that can occur when these substances are deposited to land at high rates. Although environmental standards for the protection of vegetation and ecosystems include sulphur dioxide (SO_2), this parameter from traffic emissions is negligible and is not of concern near roads.

High rates of nitrogen deposition upon sensitive ecosystems can increase the eutrophication of soils and water and have a detrimental effect on species-rich plant communities and semi-natural habitats that are often associated with a low nutrient status. Eutrophication can decrease species diversity and the dominant plant species can change to those better to respond to increased nitrogen levels.

Transport Infrastructure Ireland guidance[12] indicates that detailed consideration need only be given to emissions to air where there is a significant change to traffic flows (>5%) and a designated site lies within 200m of the road centre line. In relation to the proposed asphalt plant development the following is noted (refer to Plan File Ref. No. 10/1163):

- The proposed development will result in an additional 37 trips daily of which 90% will be HGVs. The increase in traffic as a percentage of the current flows on the N22 is 2.2% northbound and 0.73% southbound.
- Sheheree Bog SAC lies 1.7 km to the west of the N22 national secondary road.

It is considered therefore that any changes in air quality from traffic emissions will have no measurable effects on any habitats and vegetation within Sheheree Bog SAC, or on the integrity of this designated site. As such potential cumulative impacts from traffic associated with the development can be screened out.

Agricultural emissions of NH_3 emissions from live-stock, especially from cattle herds, are recognised as a major contributor to overall N deposition rates in Ireland. The 2020 State of the Environment report by the EPA[13] estimates that emission from farming account for 99% of National NH_3 emissions with an annual rate of 119,000 tonnes in 2018. The majority of NH_3

emissions are deposited as dry deposition within the surrounding area where live-stock farming is taking place. There are negligible NH_3 emissions from burning oil and other fossil fuels.

The results of the modelling study undertaken for the proposed asphalt plant emissions demonstrate that the contribution of such emissions to total annual N deposition rates within the locality of the Sheheree Bog SAC is predicted as imperceptible and well below 1% of the lower critical load value of 5 kgN/ha/y.

3.5 Likelihood of Significant Effects on Natura 2000 Sites

NPWS (2010) [13] guidance for planning authorities states *"If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). Screening should be undertaken without the inclusion of mitigation, unless potential impacts clearly can be avoided through the modification or redesign of the plan or project, in which case the screening process is repeated on the altered plan. The greatest level of evidence and justification will be needed in circumstances when the process ends at screening stage on grounds of no impact."* This approach is adopted in this report to appraising likely significant effects of the proposed project.

A significant effect is defined in paragraph 49 of the Waddenzee Case C-127/02 (https://curia.europa.eu/juris/showPdf.jsf?text=&docid=49452&doclang=EN) as follows *"..... pursuant to the first sentence of Article 6(3) of the Habitats Directive, where a plan or project not directly connected with or necessary to the management of a site is likely to undermine the site's conservation objectives, it must be considered likely to have a significant effect on that site. The assessment of that risk must be made in the light inter alia of the characteristics and specific environmental conditions of the site concerned by such a plan or project."*

In the Judgement of Ms. Justice Niamh Hyland delivered on 15 January 2021 IEHC 16 Record Number 2018 740 JR; Justice Hyland refers to the findings of Advocate General Sharpston in *Case C–258/11 Sweetman v. An Bord Pleanala* ECLI:EU:C:2012:743 at paragraph 47 to 49 are of relevance, and state as follows:

> *"47. It follows that the possibility of there being significant effect on the site will generate the need for an appropriate assessment for the purposes of Article 6 (3). The requirement at this stage that the plan or project be likely to have a significant effect is thus a trigger for the obligation to carry out an appropriate assessment. There is no need to establish such an effect; it is as Ireland observes, merely necessary to determine that there may be such an effect.*
>
> *48. The requirement that the effects in question will be "significant" exists in order to lay down the de minimus threshold. Plans or projects that have no appreciable effect on the site are thereby excluded. If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6 (3), activities on or near the site would risk being a possible by reason of legislative overkill.'*

As demonstrated above, the proposed project is not likely to result in any significant effects on Sheheree Bog SAC and as a result there is no risk of undermining the conservation objectives of the SAC. There are no uncertainties or gaps in information to reach this conclusion.

4.0 Proposed Mitigation measures

As the proposed project is not likely to result in any significant effects on Sheheree Bog SAC no specific additional mitigation measures are proposed or required to reduce or avoid impact at the Sheheree Bog SAC, or any other Natura 2000 Site within the area.

5.0 Conclusion

In the long-term, the EU's objective in relation to Article 6 of the Habitats Directive is to have non-exceedance of the critical load for Nitrogen deposition in all European ecosystem areas. However, the sum of the annual N deposition load within a specific country and within areas of that country are the cumulative loading from dry deposition and wet deposition rates of oxidised N and Reduced N (NH_3 & NH_4). These 2 fundamental atmospheric process pathways have distinct characteristics. Dry deposition is a local pathway, whereas wet deposition is predominantly a long-range pathway process. Total nitrogen dry deposition loading in an area comprises NO_x from local sources burning fossil fuels and NH_3 from agricultural sources deposited from the emission plume as it travels downwind. Wet deposition is the large-scale pathway where emissions from an exhaust stack are mixed within the cloud layer as it travels hundreds of kilometres from the emission source. As the trans-boundary emissions are mixed in the cloud the NO_x/NO_2 is converted into secondary pollutants to form nitrate aerosols within the cloud water droplets before falling as precipitation to the ground.

In the eastern region of Co. Kerry, the annual rate of N deposition (oxidised N and Reduced N) is estimated to be 3-5 kgN/ha/yr. Dry deposition of NO_x contributes only a small percentage of total annual oxidised N, with wet deposition originating from trans-boundary sources including from the Atlantic, estimated to account for 60-70% of the annual total. In contrast, over 80% of the total Reduced N deposition, is estimated to be as NH_3 dry deposition from agricultural sources within the area.

The Conservation Objectives in relation to potential impacts of atmospheric emissions at Sheheree SAC specify a current annual nitrogen deposition of 11.4 kgN/ha/yr and that the target value is 5 kgN/ha/yr.

It has been demonstrated in this response that the predicted long-term impact of emissions from the asphalt plant will have a negligible impact at this SAC. However, there is a predicted addition of 0.01 kgN/ha/y based on the dry N deposition modelling study of the potential effects of the emissions from the asphalt plant exhaust stack. The quoted 11.4 kgN/ha/yr is an estimate based on a research publication published in 2014 that applied the disaggregation of atmospheric chemistry modelling results based on a 50km x 50km grid to a microscale of 5km x 5km grid in interpreting the spatial pattern of N deposition in County Kerry. Furthermore, the 11.4 kgN/ha/y is derived from historical emission and atmospheric chemistry data that does not reflect current N deposition rates in the county. The results based on the latest atmospheric chemistry models demonstrate that there has been a substantial reduction in the annual dry and wet deposition of N since this value was calculated, both in terms of the estimated contribution from emission sources within Ireland and also contribution from trans-boundary sources.

Within the locality of Sheheree Bog SAC, NH_3 emissions are estimated to be the primary source of total annual N deposition rates at the SAC and this should be recognised in determining whether the Conservation Objective regarding air quality impacts for the SAC are achievable.

The predicted annual concentration level and deposition load at Sheheree Bog SAC due to emissions from the proposed asphalt plant is less than 1% of the annual NO_x NAQS and the critical load conservation target of 5 kg N/ha/yr specified for raised bog ecological areas. As such, oxidised N concentration or deposition rates due to emissions from the proposed development will have no perceptible effect within the SAC. Emissions of NH_3 are negligible from the operation of the asphalt plant. Therefore, based on the evaluation of the additional concentration level and deposition loading from the plant emissions, this demonstrates that the proposed project does not pose a risk of likely significant effects on the SAC.

The results of this detailed assessment of potential ambient and deposition effects likely at the Sheheree Bog SAC determine that appropriate assessment of the proposed asphalt plant is not required, as the proposed project, individually or in combination with other plans or projects, will not have a significant effect on any Natura 2000 sites.

ITEM 2:

The applicant should confirm that the information and conclusions provided on the use of terrain data in the air quality modelling exercise are also applicable to the odour modelling exercise undertaken in this instance.

Response

The results of the odour impact modelling exercise without and with terrain are given below:-

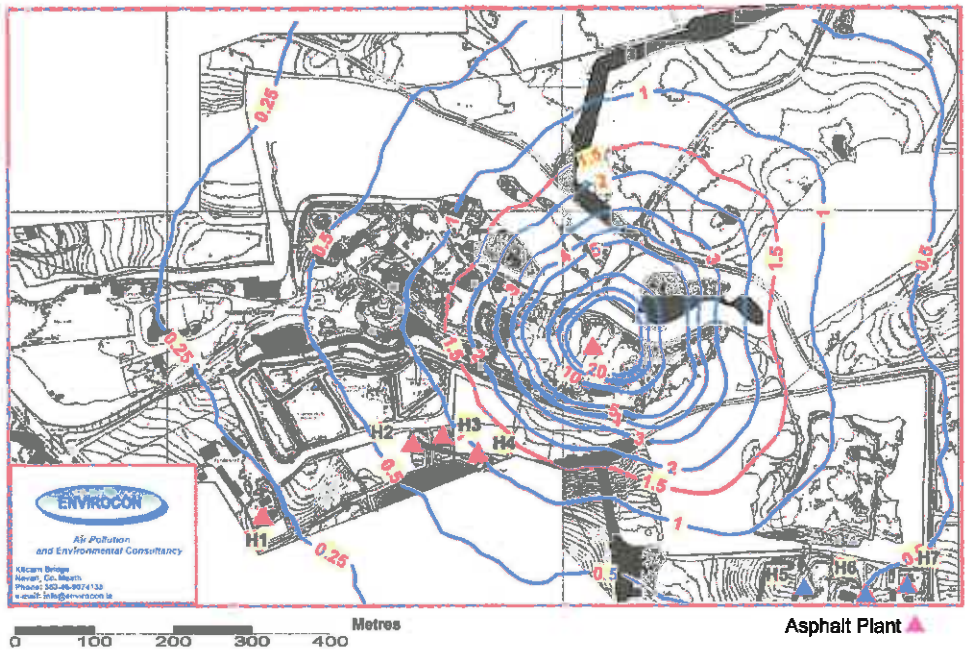

Figure 4: Predicted 98% odour concentrations – without terrain

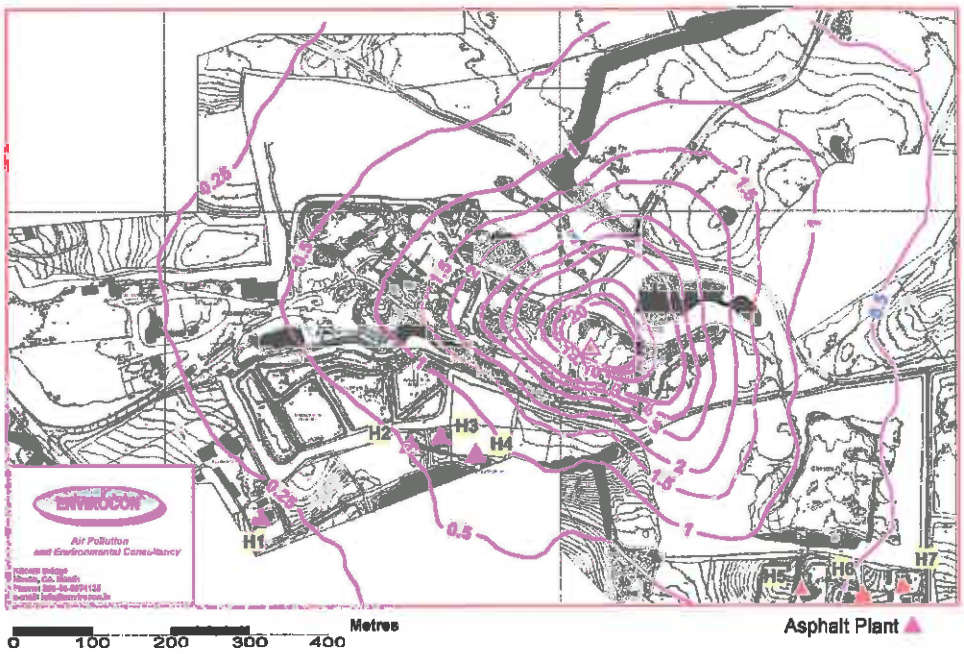

Figure 5: Predicted 98% odour concentrations – with terrain

Comparison of the predicted 98% odour concentrations between the 2 terrain modelling options, demonstrate that there is no significant difference in the magnitude or spatial extent in the predicted odour concentration contours. In addition, there is no significant change in predicted odour levels at the nearest houses to the quarry site between the 2 options.

This evaluation exercise confirms that the local topography is not a significant air dispersion modelling parameter in determining the predicted potential extent of odours from the operation of the asphalt plant. Therefore, the results submitted in the February report are an appropriate assessment of likely air quality impacts beyond the quarry boundary.

It is confirmed that the information provided on the use of terrain data in the air quality modelling exercise (FI Item 6 of February submission) are also applicable to the odour modelling study submitted in the Envirocon report of 4th February 2021.

References

(1) CERC, 2017, ADMS5, Atmospheric Dispersion Modelling System, User Guide, Cambridge

(2) Envirocon, 2020, Air Quality Impact of Asphalt Plant, Clasheen – October 2020- Air Licence Application,

(3) Government Publications, 2011, Air Quality Standards, Air Quality Standards Regulations, Stationary Office, Dublin

(4) IAQM,2020, A Guide to the assessment of air quality impacts on designated nature conservation sites; Institute of Air Quality Management

(5) IMPEL, 2015, Nature Protection in permitting and inspection of Industrial Installations – Implementation of Article 6 of the Habitats Directive; Report 2014/14: European Union Network for the Implementation and Enforcement of Environmental Law

(6) Henry and Aherne, 2014, Nitrogen deposition and exceedance of critical loads for nutrient nitrogen in Irish grasslands, Sc of Total Env,216-223

(7) Nyiri, Gauss and Klien,2010, Transboundary air pollution by main pollutants, Norwegian Meteorological Institute; www.emep.int

(8) NPWS,2015, Conservation Objectives Ardgraigue Bog SAC 002356, National Parks and Wildlife Services, Dept of Arts, Heritage and the Gaeltacht

(9) NPWS, 2015, Conservation Objectives Tullaghanrock Bog SAC 002354, , National Parks and Wildlife Services, Dept of Arts, Heritage and the Gaeltacht

(10) Payne, 2014, The exposure of British Peatlands to nitrogen deposition, 1900-2030, Mires and Peat, Vol 14.

(11) Klein, Gauss et Al, 2020, Transboundary air pollution by sulphur, nitrogen, ozone and particulate matter in 2018- Ireland

(12) National Roads Authority, 2011, Guidelines for the treatment of air quality during Planning and Construction of National Road Schemes, Appendix 9, NRA

(13) EPA, 2020, Ireland's Environment - An Integrated Assessment, Wexford