2 Crail Place
Dundee
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15 May 2013

Energy Consent Unit

Sirs,

Re: THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2000. SECTION 36 ELECTRICITY ACT APPLICATION ADDENDUM FOR PORT OF DUNDEE RENEWABLE ENERGY PLANT, AT THE PORT OF DUNDEE

Introduction

I am grateful for the opportunity to submit my comments on the Supplementary Environmental Information submitted by Forth Energy on 2 April 2013, in the form of an Addendum to the above application. My response is set out below.

Previous consultation response

I previously wrote a response to the consultation on the original application on behalf of Tayside Recyclers, whom I no longer work with. The contents of this earlier submission remain relevant to the revised proposal, and I would wish them to be carried forward in my own name as a member of the public

Contents of the current submission

As a Dundonian I want to be frank up front to make clear that I think the proposed Biomass Plant, planned to be sited adjacent to a large residential area, is totally misconceived as it will have serious adverse impacts on the health of Dundee's citizens

I wish to offer a critique of a key passage in the latest Addendum submitted by Forth Energy (FE). I have copied this passage below and include comment and rebuttal, where appropriate, to its contents

The stance taken by FE is superficially laudable but the following critique shows them to be disingenuous as they do not follow their own stated intent

In order to make informed comment, members of the public should not have to attain the same level of technical and scientific expertise as the the writers of the Full Report and Addenda. This critique is presented in the expectation that, in responding to it, FE will have to convince the general public, who, after all, will be the one's who experience its effects, good or ill

Addendum 2 P31
3.4.10
This predicted annual mean NO2 contribution from the REP main stack is based on the very conservative assumption that 70% of the NOx emitted from the stack (which comprises nitric oxide (NO) and NO2) is converted to NO2 at ground level. This approach is described in the Environment Agency guidance6
http://www.environment-agency.gov.uk/static/documents/Conversion_ratios_for__NOx_and_NO2_.pdf
as the "worst case scenario" (SEPA has not published guidance on this issue). We think it remiss of FE to selectively quote from this guidance and now insert it into the text so that it can be scrutinised fully.

CONVERSION RATIOS FOR NO_x AND NO_2

In modelling air dispersion of NO_x from combustion sources, the source term should be expressed as NO_2, e.g., NO_x mass (expressed as NO_2) = total NO (mole) × 46/30.
Note that these conversion ratios are only considered appropriate for combustion processes, where no more than 10% of the NO_x is emitted as NO_2.
Use the following phased approach for assessment:

1. Screening/worst case scenario *Remember FE consistently expresses its practice of following a "worst case or conservative" approach*

50% and **100%** of the modelled values should be used for short-term and long-term average concentration respectively. If PEC (process contribution + "relevant background concentration") exceeds the relevant air quality objective, then proceed to step 2.
Long-term: "Relevant background concentration" = background **annual** means.
Short-term: "Relevant background concentration" = 2 x background annual means.

2. Worse case scenario

35% for short-term and **70%** for long-term average concentration should be considered. If PEC (process contribution + "relevant background concentration") exceeds the relevant air quality objective, then proceed to step 3.

3. Case specific scenario

Operators are asked to **justify** their use of percentages lower than **35%** for short-term and **70%** for long-term in their application reports.

• The validity of an "ozone-limiting" procedure for assessment of likely maximum conversion of NO_x to NO_2 should be assessed on a caseby-case basis.

• In some models, ozone photochemistry algorithms may have been used in the prediction of NO_2 concentrations. However, such algorithms require **valid inputs of ozone concentrations, sunlight**, etc, (ie not guesses!) it is advised that **uncertainties be quantified and justified** before modelled predictions are accepted

SOURCE: Environment Agency, Air Quality Modelling and Assessment Unit

This guidance states that, if necessary, a "case specific scenario" should be used where the "worst case scenario" indicates a potential exceedence of the air quality objective. The EA is being very generous to applicants, giving the worst case scenario modelling breaches of the limits not one but two additional bites at the cherry. FE claim they are following the EA Guidance; however it is quite explicit that the 70% conversion rate should be used if the AQO is exceeded for long term assessments while the short term assessments can be made using a lower rate of 35% if the AQO is exceeded but any further reduction requires "justification" ()which the applicant attempts to provide in the next paragraph. FE has used the lower rate of 35% for the long term assessments. They claim on page 41 (under 9.8.5, bullet point 5) that they have used the 70% ratio but this is a false claim. By using the lower rate (35%) for long-term ie annual emissions, FE managed to reduce the REP impact to keep below the 40ug level.

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Due to the very detailed assessment undertaken in this Addendum Report, and the fact that the annual mean air quality objective is forecast to be exceeded at a small number of locations with or without the development in place, the use of the "worst case scenario" was examined in further detail in order to further refine the assessment. The steps decribed above are quite clear; this last sentence is nonsense! This examination included considering the use of a more realistic estimation of how much NO is oxidised to NO_2 at the modelled receptor locations. The use of a more realistic estimation of the conversion of NO to NO_2 is consistent with the approach adopted in the ES Addendum dated November 2010 and further detail of its use in this assessment is provided below. All this says is "we have lowered the conversion rate because it's the only way we can avoid significant breaches". That's not a justification!

3.4.11

In the ES Addendum dated November 2010, the method utilised to calculate the proportion of the emitted NOx that will be in the form of NO_2 at a ground level receptor was the empirical estimates made by Janssen et al[7] which are based on a comprehensive study of observations within power station plumes. The rate of oxidation of NO to NO_2 depends on both the chemical reaction rates and the dispersion of the plume in the atmosphere. The oxidation rate is dependent on a number of factors that include the prevailing concentration of ozone, the wind speed and the atmospheric stability. The previous November 2010 ES Addendum identified that the conversion of NOx to NO_2 at Receptor 22 was in the order of 15%, rather than the "worst case scenario" approach of 70%.

This approach was reviewed by DCC (via a third party air quality specialist consultancy) and it was concluded:

"It is concluded that the revised estimates of the proportion of NOx present as nitrogen dioxide provided in the revised addendum [ES Addendum dated November 2010] are reasonably reliable as a best estimate of this proportion." It should be noted that the un-named "specialist consultant" doesn't seem to have pointed out the erroneous use of Janssen for long term modelling, The consultant's judgement that the revised estimates "are reasonably reliable as a best estimate" seems a bit of an incongruous statement; how can an estimate be "reasonably reliable" and "best" at the same time?

3.4.12

DCC's review (evidence?) highlighted that the NOx to NO_2 conversation would vary between a range of 4% to 41% with a median of 18%, depending on the variation in weather conditions and time of day /year and that the use of a 15% conversion factor at Receptor 22 (i.e. 141 / 143 Broughty Ferry Road) was "reasonably reliable." DCC is being quoted as over-riding the EA Guidance!

3.4.13

In view of this, the information which feeds into the determination of the conversion factor was updated (namely the measured ambient ozone concentration) to check the conversion factor against the previous factor. Using a slightly higher ozone concentration (29ppb) results in a calculated NOx to NO_2 conversion factor of 16% at Receptor 22. FE really does need to evidence their unorthodox chemistry and subject it to per review. The factor will be less than this at the Receptor locations closer to the REP site (i.e. at Receptors 1 – 19 where the conversion factor ranges from 6% - 14%) and slightly higher at Receptors 25 and 26 (18% - 20%), with a similar factor of 16% at Receptors 20, 21, 23 and 24 (15% - 17%) close to the Stannergate roundabout. As use of the Janssen approach to convert the modelled NOx to NO_2 concentrations at specific receptors would negate the conservative approach for this particular aspect of the assessment, it is clear that the use of the 70% conversion factor is a highly unrealistic assumption. This last sentence is nonsensical, circular logic! On the above basis, and to ~~retain~~ undermine! the maximum potential impact

6 Environment Agency: Air Quality Modelling and Assessment Unit, Frequently asked questions and further guidance, Conversion Ratios for NOx and NO_2 accessed at ww.environment-agency.gov.uk, October 2010

7 L.H.J.M. Janssen, J.H.A. Van Wakeren, H. Van Duuren and A.J. Elshout, A Classification of NO Oxidation Rates in Power Plant Plumes Based on Atmospheric Conditions, At mospheric Environment Vol. 22, No. 1, pp. 43 – 53. 1988.

approach adopted throughout the whole air quality assessment, a conversion factor for each receptor was determined based on the Janssen approach. This conversion rate was then multiplied by a factor of 2 (think of a number, double it!) to ensure the conversion factor was conservative, based on a more realistic conservative assumption. The calculated NOx to NO_2

conversion factors, and further details of the Janssen approach and calculations, are set out in Appendix E.
For Receptor 22, (141 / 143 Broughty Ferry Road), the NOx to NO_2 conversion was determined as 32%, which is almost half of the unrealistic conversion factor of 70%. The results in Table 11 were recalculated using this “Adapted Janssen” approach as described above and the results are set out in Table 12

TABLE 12 IS LOCATED HERE
The original conservative projections have magically halved to the point of making the REP's impact negligible or imperceptible!
3.4.14
The results in Table 12 indicate that the emissions from the REP main stack will contribute up to 0.5µg/m^3 to the annual mean NO_2 concentration at any of the receptor locations (any apparent increases greater than 0.5µg/m^3 shown in Table 12 are due to rounding). The results indicate that the NO_2 annual mean air quality objective is forecast to be exceeded at four receptor locations.

3.4.15
As well as comparing the total predicted environmental concentrations to the annual mean air quality objective of 40µg/m^3, the impact of the potential increases due to the road traffic and REP plant emissions was described using guidance produced by Environmental Protection UK (EPUK)[8]. This is the same approach as adopted for the ES Addendum dated November 2010, as requested by DCC and its air quality specialist consultancy. The EPUK guidance takes a number of aspects into account when determining the impact of a development. These are:

- The magnitude of change in relation to the air quality objectives; and
- Air quality impact descriptors which take into account the magnitude of change and the absolute concentrations in relation to the air quality objectives.

3.4.16
A judgement of the overall significance of the air quality impacts of the proposed development based on a number of factors, is set out in Chapter 6.
3.4.17
The definitions of impact magnitude used in the assessment of nitrogen dioxide concentrations are set out in Table 13. These relate to changes in the annual mean concentration in relation to the annual mean air quality objective of 40µg/m^3. For example, an Imperceptible change is a change which is less than 1% of the air quality objective value. A Small change is identified when the change is between 1% and 5% of the air quality objective, and so on.
To sum up, FE has salami sliced the figures from worse case scenario to the point where the ratios become imperceptible, a very clever sleight of hand, but rather cynical when the health of Dundee's citizens is at stake. The same tactics are used for particulates whose effects are even more insidious than NO2

Yours faithfully
Doug McLaren