Air Quality Significance Criteria

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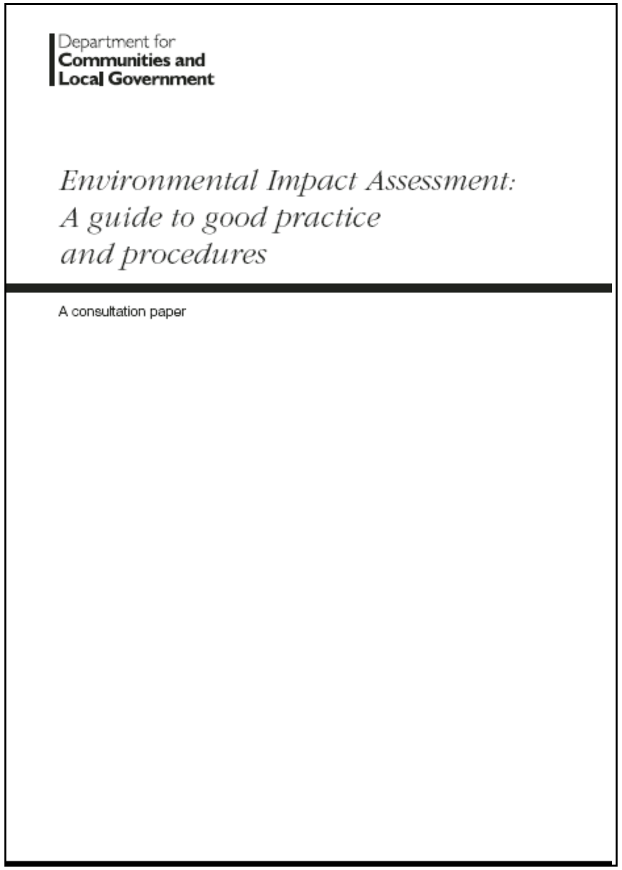
Roles of EPUK & IAQM

"We bring together environmental professionals, industry, policy makers, academics, and the public to **inform** debate and **influence** changes to policy and practice in the following areas : air quality & climate change; land quality, noise"

"The mission of the Institute of Air Quality Management is to be an **authoritative voice** by maintaining, enhancing and promoting the **highest standards of working practices** in the field of air quality**".**

Government EIA guidance

- Significance Criteria may be based on
  - **Regulations** or standards
  - Reference to criteria such as protected sites
  - Consultation with consultees and decision makers
  - Compliance with plan (e.g. **AQAP**) objectives
  - Comparison with experience on similar projects elsewhere
  - **Experience and professional judgement** of the **specialist assessor**



Department for
Communities and Local Government

Environmental Impact Assessment: A guide to good practice and procedures

A consultation paper

2006

EIA guidance

- <u>Magnitude</u> - a measure of the change to the existing condition

- <u>Sensitivity</u> - how sensitive the identified receptor is to change

Government guidance

- Significance is generally determined on the basis of **expert judgement**. …is important to ensure that …is **transparent and repeatable**. The most effect way of doing this is the devise significance criteria on which to base the decision.
- Significance is a function of:
  - Value of the resource
  - Magnitude of the impact
  - Duration
  - Reversibility
  - The number and sensitivity of receptors

Are SC needed for AQIAs?

Magnitude – need for a minimum?

- Quoting absolute concentrations to one (or more) decimal point is dubious
- Chemiluminescent analyzer is only accurate to $\pm$15%
- Model uncertainty?
- Models better at predicting changes than absolute concentrations.
- How accurate is the with development transport data?

Table 10: Example

Table 10. An Example of Descriptors for Changes in Ambient Concentrations of Nitrogen Dioxide and PM_{10}.

Magnitude of Change	Annual Mean NO_2 / PM_{10}	Days PM_{10} >50 $\mu g/m^3$
Very large	Increase/decrease > 25%	Increase/decrease > 25 days
Large	Increase/decrease 15-25%	Increase/decrease 15-25 days
Medium	Increase/decrease 10-15%	Increase/decrease 10-15 days
Small	Increase/decrease 5-10%	Increase/decrease 5-10 days
Very Small	Increase/decrease 1-5%	Increase/decrease 1-5 days
Extremely Small	Increase/decrease <1%	Increase/decrease <1 days

Magnitude – need for a minimum?

- Is there a change that is too small to be considered significant?
- Table 10 - <1% should be better defined because if could mean a 0.0001µg/m^3 change.
- Round to nearest 1 µg/m^3

Table 11: Example

Table 11. An Example of Descriptors for Impact Significance for Nitrogen Dioxide and PM_{10}.

Air Quality Impact Significance Criteria

Absolute Concentration in Relation to Standard	Extremely Small	Very Small	Small	Medium	Large	Very Large
Decrease with scheme						
Above Standard with Scheme	slight beneficial	slight beneficial	substantial beneficial	substantial beneficial	very substantial beneficial	very substantial beneficial
Above Standard without scheme Below with Scheme	slight beneficial	moderate beneficial	substantial beneficial	substantial beneficial	very substantial beneficial	very substantial beneficial
Below Standard without scheme, but not Well Below	negligible	slight beneficial	slight beneficial	moderate beneficial	moderate beneficial	substantial beneficial
Well Below Standard without scheme	negligible	negligible	slight beneficial	slight beneficial	slight beneficial	moderate beneficial
Increase with scheme						
Above Standard wihtout scheme	slight adverse	slight adverse	substantial adverse	substantial adverse	very substantial adverse	very substantial adverse
Below Standard without scheme Above with Scheme	slight adverse	moderate adverse	substantial adverse	substantial adverse	very substantial adverse	very substantial adverse
Below Standard with Scheme, but not Well Below	negligible	slight adverse	slight adverse	moderate adverse	moderate adverse	substantial adverse
Well Below Standard with Scheme	negligible	negligible	slight adverse	slight adverse	slight adverse	moderate adverse

Sensitivity

- Table 11 - sensitivity defined in terms of the current air quality, not in terms of the number of people affected.
- Should sensitivity include a measure of the number of people affected?
- Relevant exposure – EU Limit Values

Benefits and **Disbenefits**

- What happens when there are both positive and negative impacts of a proposed development e.g. a new road?

A new approach: "headroom"

- Example 1:
  - Baseline 35 µg/m^3 ; headroom = 5 µg/m^3
  - Development causes an increase of 1µg/m^3 i.e. 20% of headroom.
- Example 2:
  - Baseline 20 µg/m^3 ; headroom = 20 µg/m^3
  - Development causes an increase of 1µg/m^3 i.e. 5% of headroom.
- Example 3
  - Baseline 42 µg/m^3
  - Development causes an increase of 1µg/m^3 - 200% of headroom.

Should Other Impacts be Included?

- Amenity
  - Construction dust
  - Odour
- Ecosystems
- Criteria for each
- Take the most significant (worse) impact as the overall impact

Table 12

Air Quality Impact Significance Criteria – New Exposure

Absolute Concentration at New Properties in Relation to Standard	Number of new properties exposed to concentration			
	0-20	20-100	100-500	>500
Above Standard	slight adverse	moderate adverse	substantial adverse	very substantial adverse
Below Standard but not Well Below	negligible	negligible	slight adverse	slight adverse
Well Below Standard	negligible	negligible	negligible	negligible

Well below the standard = < 75% of the standard level.

‘Standard’ in the context of this table relates to specific air quality objective or Limit Value in question

Consistency - Slight Adverse Impact

- Table 11 - change from 39.9 to 40.1 µg/m^3
- Table 12 - exposing >500 people to concentrations of 39 µg/m^3
- Proportionate?
- Consistent?

London Councils APECs

	Nitrogen Dioxide Annual Mean	Recommendation
APEC – A	> 5% below national objective	**No air quality grounds for refusal**; however mitigation of any emissions should be considered.
APEC – B	Between 5% below or above national objective	**May not be sufficient air quality grounds for refusal**, however appropriate mitigation must be considered e.g., Maximise distance from pollutant source, proven ventilation systems, parking considerations, winter gardens, internal layout considered and internal pollutant emissions minimised.
APEC – C	> 5% above national objective	**Refusal on air quality grounds should be anticipated**, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes of mitigation measures.

*<u>Note</u>**:** Applicable ranges assume downward pollutant trend has been established.*

Consistency with London guidance?

- 40 km^2 in London has background concentrations above 40 $\mu g/m^3$, so no mitigation will work; Should development be allowed?
- Should EPUK guidance be consistent with London guidance?

Table 3

Table 3. Recommendations following the assessment of significance by the local authority

Impact significance from flow chart	Recommendation
Overriding consideration	Require mitigation measures to remove “overriding” impacts. If the impact is still “overriding”, there should be a strong presumption for a recommendation for refusal on air quality grounds.
High priority consideration	Ensure that measures to minimise “high priority” impacts are appropriate in the proposal. Recommend strengthening the measures if appropriate. Consideration may also be given to compensation/offsetting. Depending on the scale of the impacts, taking into account the number of people affected, the absolute levels and the magnitude of the changes, and the suitability of the measures to minimise impacts, it may be appropriate to recommend refusal.
Medium priority consideration	Seek mitigation measures to reduce “medium priority” impacts. Offsetting and compensation measures may also be considered. It is unlikely that refusal would be recommended.
Low priority consideration	Encourage the use of readily available measures to mitigate, offset or compensate for impacts, where appropriate.

Table 3

- Table 3 should be the main criteria used?
- Tables 10 to 12 are examples, but are treated as if they are cast in stone
- More examples needed?

Conclusions - 1

1. IAQM - leadership on guidance and publically support elements/all the EPUK guidance
2. AQ professionals = MIAQM/FIAQM = ability to make professional judgements
3. Table 3 should be the prime determining criteria for AQIA with degree of consistency with London Council's guidance
4. Significance criteria should only be used for EIA
5. There should be a minimum concentration above which there may be a significant impact

Conclusions - 2

6. More examples needed to replace/add to Tables 10-12 to make it clearer they are just examples
7. Guidance should be extended to other impacts