Guiding Principles for Air Quality Assessments – IAIA's guide

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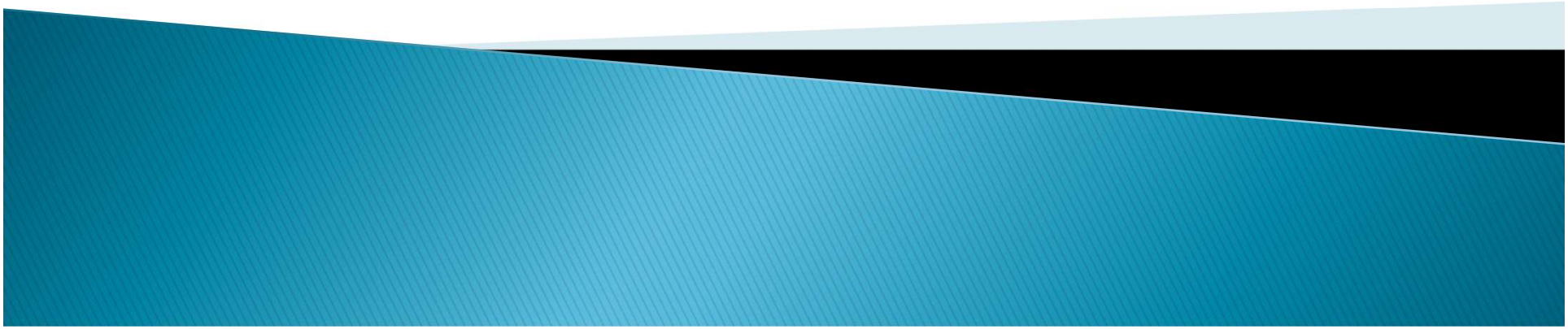


DiGiSci Environmental Consulting Inc.

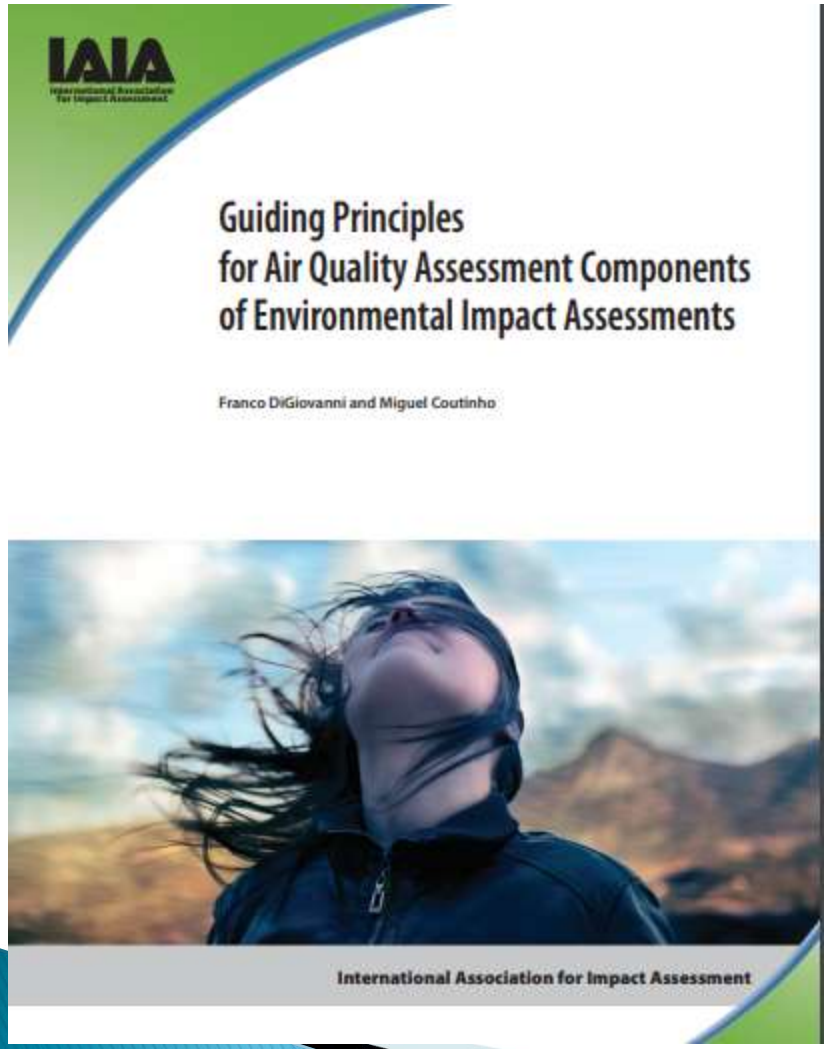
- Air/noise permitting in Ontario and across Canada
- Annual emissions reporting (NPRI/GHGs)
- Land Use Compatibility Assessments (land Use Planning)
- Environmental Assessments (International)

- 25 years international experience
- World-class academic qualifications
- A business leader in air quality consulting
- General environmental – one-stop shop

Agenda

- Introduction
- Worst-case impacts
- Project Scoping
- Identifying emissions
- Estimating/modelling air quality levels
- Appropriate meteorological data
- Baseline AQ levels
- Unavailable/uncertain inputs: Principle of Conservatism
- Use of results
- Professional responsibilities and academic requirements
- Summary

Introduction



- IAIA Special Interest Publication
- A "living document"

- Needed to address uncertainties and inappropriate methods
- Audience – experienced practitioners and regulatory reviewers

- Meant to "overlay" jurisdictional regulatory advice, not replace it

Worst-case/maximal impacts

- Must address highest air quality levels that can occur
- Maximal emissions + worst-case dispersal conditions + highest baseline (if they occur at the same time?)

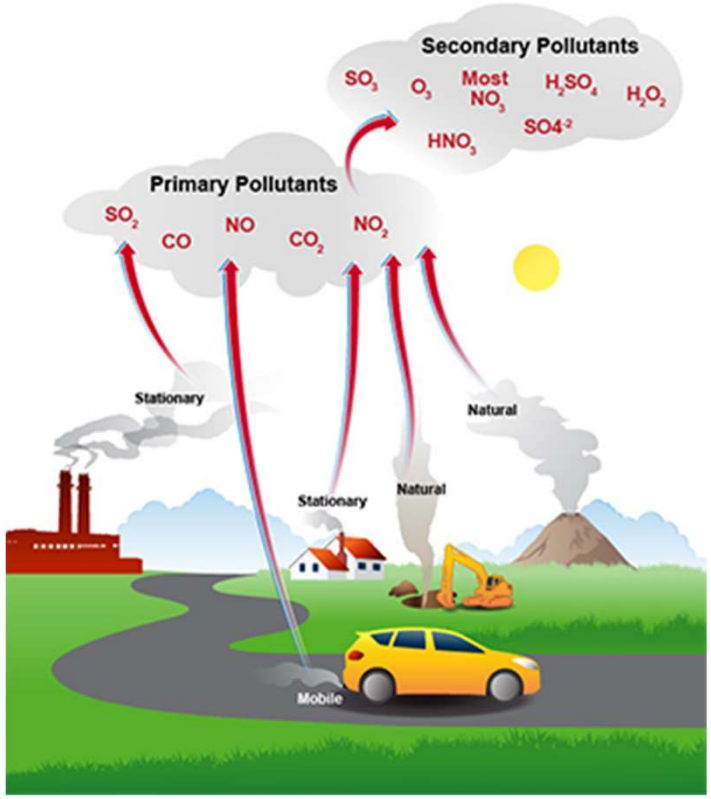
Project Scoping

- Usually the first step
- Often a public consultation
- Development of Terms of Reference (ToR)

Identifying Emissions – identifying sources

- ToR usually defines scope of sources
- E.g., are transport vehicles (trucks on public roads) in or out?

Identifying Emissions – identifying contaminants



- If screened-out, should provide rationale
- Contaminants of Potential Concern (CoPC's) emitted from "subject" facility
- Bear in-mind for baseline assessment

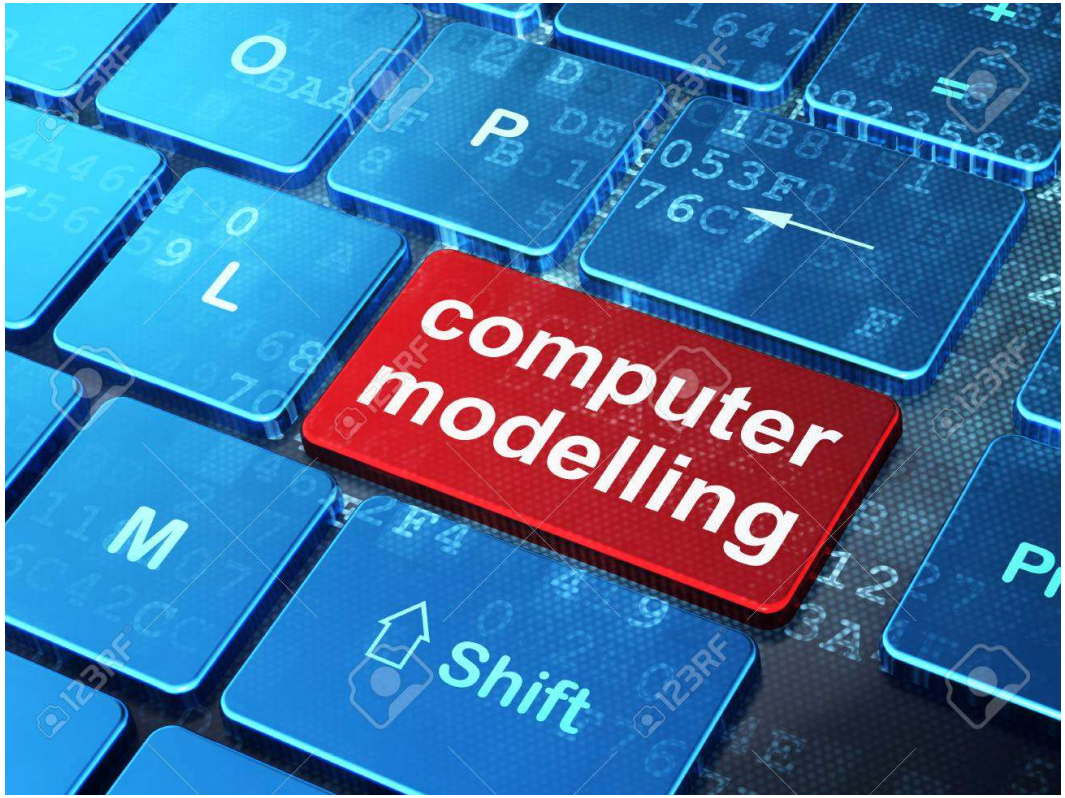
Identifying Emissions – fugitive dust emissions

- Fugitive emissions
- Fugitive dust
- Size fractions required
- Species fractions also required

Identifying Emissions – quantifying emission rates

- Emission rates from jurisdictional advice, e.g., US EPA AP-42 EF's
- Accounting for spatial and temporal variability
- Temporal resolution of emission rates

Resultant increments in surrounding AQ



- Can be measured, for existing facilities
- Predicatively by modelling
- Choice of models by Jurisdiction

Using Appropriate Meteorological Data

- Required for most dispersion models
- 5 years worth of data
- Modelled met data

Adding Increments to Baseline – assessing baseline

- Baseline resulting from "non-subject" sources
- Spatial/temporal variations in baseline
- Local variations matter → regional versus local components of baseline
- Local components explicitly included in modelling

Unavailable/uncertain input data: The Principle of Conservatism

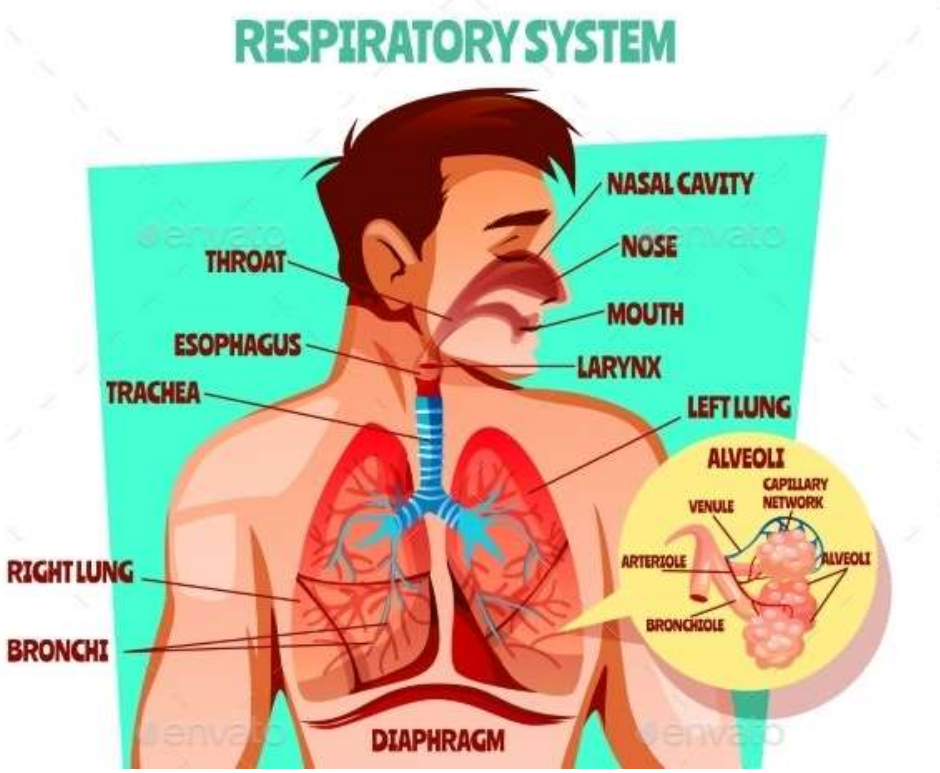
- Substitute data must be conservative
- Extended discussion – often misunderstood/abused
- Example of gravel road in a proposed aggregate pit

Unavailable/uncertain input data: The Principle of Conservatism – Example

- AP-42 EF uses silt levels
- Readily available data suggest an upper limit of 16%
- Using an average is <u>not</u> conservative

Evaluating the Results of an AQ Impact Assessment

- Changes in air quality levels compared to standards ("pass/fail")
- In addition, often have to pass results to Health Impact Experts
- ……and/or ecological impact experts



Summary

1. The Terms of Reference of the EIA should be sufficiently clear and encompassing to incorporate all sources of air emissions to be included in the air quality impact assessment.
2. Worst-case air quality impacts are assessed by considering a combination of maximal emissions combined with worst-case (poor dispersion) meteorology.
3. All potential sources of air emissions must be identified in order to fully identify all contaminants potentially emitted (Contaminants of Potential Concern). These can include components (species) of fugitive dusts.
4. Project emissions can vary in time and space; these variations should be recognized and accounted for.
5. Emission variations over a finer timescale, than the respective air quality standard averaging period, may be necessary to avoid underestimating air quality impacts.
6. Spatial and temporal variations in baseline air quality levels must be recognized and accounted for.
7. Assessment input data, if not garnered in a site-specific accurate manner, may be estimated as long as it is estimated in a fully conservative manner or on a (more refined) probabilistic basis.

Qualifications/Experience of a Practitioner

- Minimum – Masters in air quality (by thesis)
- Licensed Professional (public safety highest priority)
- At least 5 years experience

IAIA's Role

- Promote use of its Guides
- Encourage membership and regulatory authorities to adopt those Guides
- E.g., proposal to adopt Air Quality Guide to Canadian Institute of Mining → NI43-101 filings

- Volunteer "Super-Users"?

Questions?

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Thank you!

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