QUALITY ASSURANCE PROJECT PLAN (QAPjP) and QA Report for Pacific 2001

Prepared by: Jan Bottenheim
Date:

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1. **Principal Investigator**
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2. **Team Members**
   Dr. J.W. Bottenheim (address as above)

3. **Measurement Program**
   In-situ G.C. analysis of Oxygenated Volatile Organic Compounds

4. **Measurement Species and Units**
   Units are ppt(v) compound for all species:
   Sepecies
   - methanol
   - ethanol
   - n-propanol
   - n-butanol
   - acetaldehyde
   - propanal
   - butanal
   - methacrolein
   - acetone
   - 2-butanone
   - methyl vinyl ketone
   - isoprene
   - benzene
   - toluene
   - xylene isomers
   - alpha-pinene
   - beta-pinene
   - d-limonene
   - camphene

5. **Measurement Species and Units**
   Gas phase

6. **Measurement Platform (surface, airborne)**
   Surface

7. **Measurement Sites (surface only)**
   Golden Ears Park
   Langley

8. **Measurement Objective(s)**
   To measure OVOCs at a rural and surburban location

9. Measurement Details

9.1. Field Measurements

9.1.1. Measurement Principle

GC-FID, GC-MS with cryogenic preconcentration

9.1.2. Instrumentation (Manufacturer/Model)

Agilent 5890 GC, Tekmar 6000/Aerocan preconcentrator. J&W DB-Wax analytical column.

9.1.3. Flow System

10m X 6mm PFA sample line fitted with a 47mm, 0.5 micron Teflon filter at its inlet. Continuous flow by means of a GAST vacuum pump.

9.1.4. Inlet Height Above Ground (if surface)

8m above ground level on top of a trailer.

9.1.5. Nominal Flow Rate

Sample line - 30 lpm, preconcentration - 100 mL/min.

9.1.6. Flow Measurement/Control

Mass Flow Controller internal in preconcentrator.

9.1.7. Flow Temperature and Pressure

Ambient temperature and pressure.

9.1.8. Sampling Times/Period/Frequency

90 minute interval, 10 minute integration period.

9.1.9. Sampling Methods N/A - in-situ analysis

Cryogenic preconcentration

9.1.10. Filter Type/Coating Type/Reagent Type

N/A

9.1.11. Planned Changes to Instruments or Methods During Study

Not planned

9.2. Laboratory Measurements (If Applicable)

9.2.1. Laboratory Name and Address In-situ (see above)

Not applicable

9.2.2. Analytical Method(s)

N/A

9.2.3. Sample Extraction or Work-up
N/A

9.2.4. Analytical Detection Limits
100 ppt(v) compound or better based on 3 S.D. of blank or baseline noise.

10. Quality Assurance/Quality Control

10.1. Field Quality Assurance/Quality Control

10.1.1. Traceability
NIST traceable standard gas mixtures, gravimetrically calibrated permeation sources.

10.1.2. Calibration
Permeation source with dilution system, direct injections of gas mixtures.

10.1.3. Zeros and spans
Non-injection blanks, sampling of whole air standard material through sampling inlet. Daily.

10.1.4. Blanks
Flush gas blanks, daily.

10.1.5. Field Quality Control procedures
Manual daily data and instrument inspection by PI. Daily calibration assessments.

10.1.6. Precision determination
Repeated analysis of whole air standard material.

10.1.7. Comparison with other measurements
Comparison with previous data from similar sites. No direct comparisons available.

10.1.8. Inspections and Audits
PI continuously on site during measurement campaign.

10.2. Laboratory Quality Assurance/Quality Control

10.2.1. Traceability
N/A

10.2.2. Calibration procedures
N/A

10.2.3. Blanks
N/A

10.2.4. Other lab QC
N/A

10.2.5. Precision determination
N/A

10.2.6. Comparison with other methods
N/A

10.2.7. Audits
N/A

11. Data Management and Quality Control

11.1. Raw Data Recording
Data collected automatically at the end of each analysis by PC-based data system.

11.2. Final Data Reporting
Each sample to be reported.

11.3. Data Quality Control and Validation

11.4. Validity Flags
NARSTO flags

11.5. Below Method Detection Limit Values
Data less than 3 S.D. of blank reported as below MDL. Data less than 10 S.D. of blank, but equal to or more than 3 S.D. of blank reported as below Method Quantitaion Limit.

11.6. Derived Parameters
N/A

11.7. Explanation of Zero or Negative Data
N/A

12. Data Quality Objectives (Pre-Study)

12.1. Accuracy
25% target

12.2. Precision
10% based on relative standard deviation of whole air standard material analysis

12.3. Comparability

Not applicable

12.4. Representativeness

The measurements at the Golden Ears Park will be representative of the conditions under which biogenic emissions are dominant and the biogenic particles are generated with limited anthropogenic pollutants. The measurements at the Langley site will be representative of processed air pollution in which secondary pollutants, such as ozone and secondary particulate matter, will have formed.

12.5. Completeness

Target = 75%

12.6. Other Quality Information

End of Pre-Study QAPjP

Start of Post-Study QA Report

13. Significant Changes to Site, Instruments or Methods During Study

14. Post-study Data Quality Indicators (DQIs)

    14.1.1. Accuracy

    14.1.2. Precision

    14.1.3. Comparability

    14.1.4. Representativeness

    14.1.5. Completeness

    14.2. Blank correction (describe whether done and method used):

    14.3. Other Quality Information

15. References: