

Introduction to the portable instruments

Alpha Thapa

Intern

Atmosphere Initiative,

Theme: Water & Air

16 November 2015

- **Pollutant Measurement Techniques**
- **Instrument Details**
 - **MicroAeth**
 - **Indoor Air Quality Probe**
 - **Aerosol Mass Monitor**
- **Methodology**
 - **Data Collection**
 - **Data Processing and Analysis**

- Ambient Air Monitoring and
- Emissions Measurement

1. MicroAeth

To Measure:

- Black Carbon (BC)

Operating Principle:

- Optical Light Attenuation based on Deposition



2. Indoor Air Quality Probe (GrayWolf IAQ-610)

ICIMOD

To Measure:

Volatile Organic Compounds (VOCs)
Carbon Dioxide (CO₂)
Carbon Monoxide (CO)
Temperature
Relative Humidity

Operating Principles:

Photoionization
NDIR CO₂ Sensors
Electrochemical Sensors
Temperature Sensors
RH Sensors



Realtime

File	Log	Probe	View
TVOC		256 ppb	
Carbon Dioxide		945 ppm	
Carbon Monoxide		1.3 ppm	
Ozone		0.04 ppm	
Temperature		18.9 °C	
Relative Humidity		17.3 %RH	

Photo(s) attached

Time Tagged Event Note attached

Audio Note attached

Text Note attached

Drawing attached

Menu Snap Live: Bldg 6/General Office

Example Screens

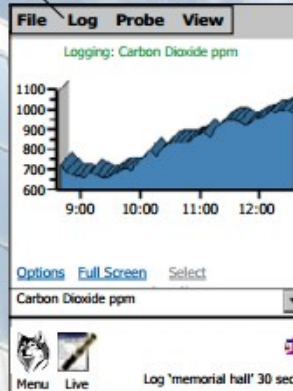
Snap-Shot Log

File	Log	Probe	View
TVOC		530 µg/m3	
Carbon Dioxide		534 ppm	
Ammonia		0.4 ppm	
Carbon Monoxide		0.4 ppm	
Temperature		21.4 °C	
Relative Humidity		17.9 %RH	

Menu Snap Live: Bldg 6/General Office

Click the SNAP icon to record measurements, time, date and detailed location name

Trend Log Graph



Log at intervals of your choice. Optionally display trend graphs on meter

Audio Note

WolfSense 2013

Audio Note: Hospital/Nurses Strn

Available Memory: 4015MB or approx 388 minutes of recording at 11KHz

UK



3. Aerosol Mass Monitor

To Measure:

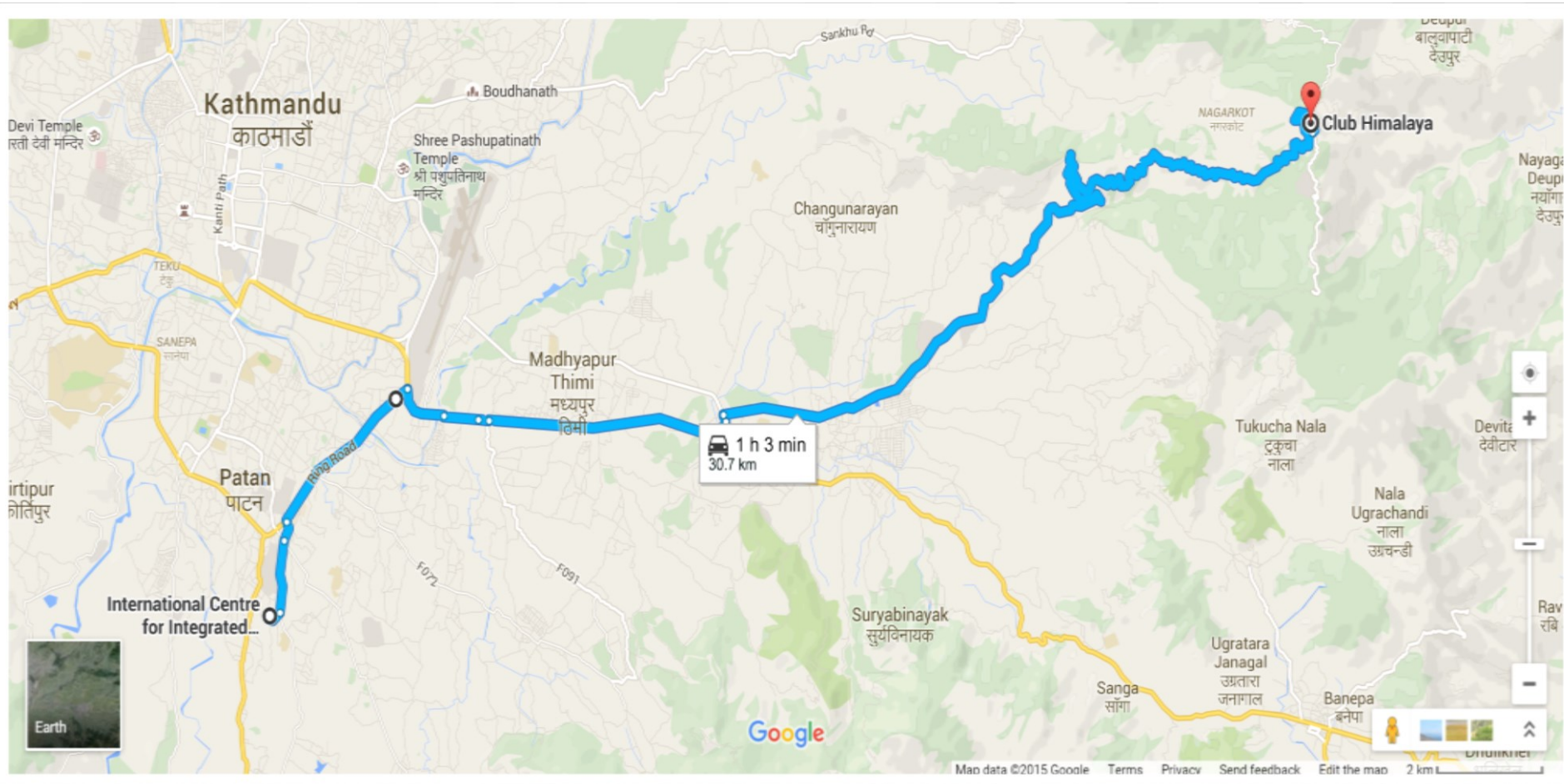
- Total Suspended Particles (TSP)
- Five Mass Ranges (PM1, PM2.5, PM4, PM10 and TSP)



Operating Principle:

- Particle count to mass conversion

- Part 1: Data Collection
- Part 2: Data Processing and Analysis



Map1: Route Map from ICIMOD to Club Himalaya

Data Analysis: IAQ Probe

TVOC ppb:

Min = 106

Max = 237

Average = 142.1

Carbon Dioxide (CO₂) ppm:

Min = 320

Max = 619

Average = 452.5

Carbon Monoxide (CO) ppm:

Min = 0.0

Max = 2.7

Average = 0.25

Temperature °C:

Min = 24.9

Max = 29.6

Average = 26.97

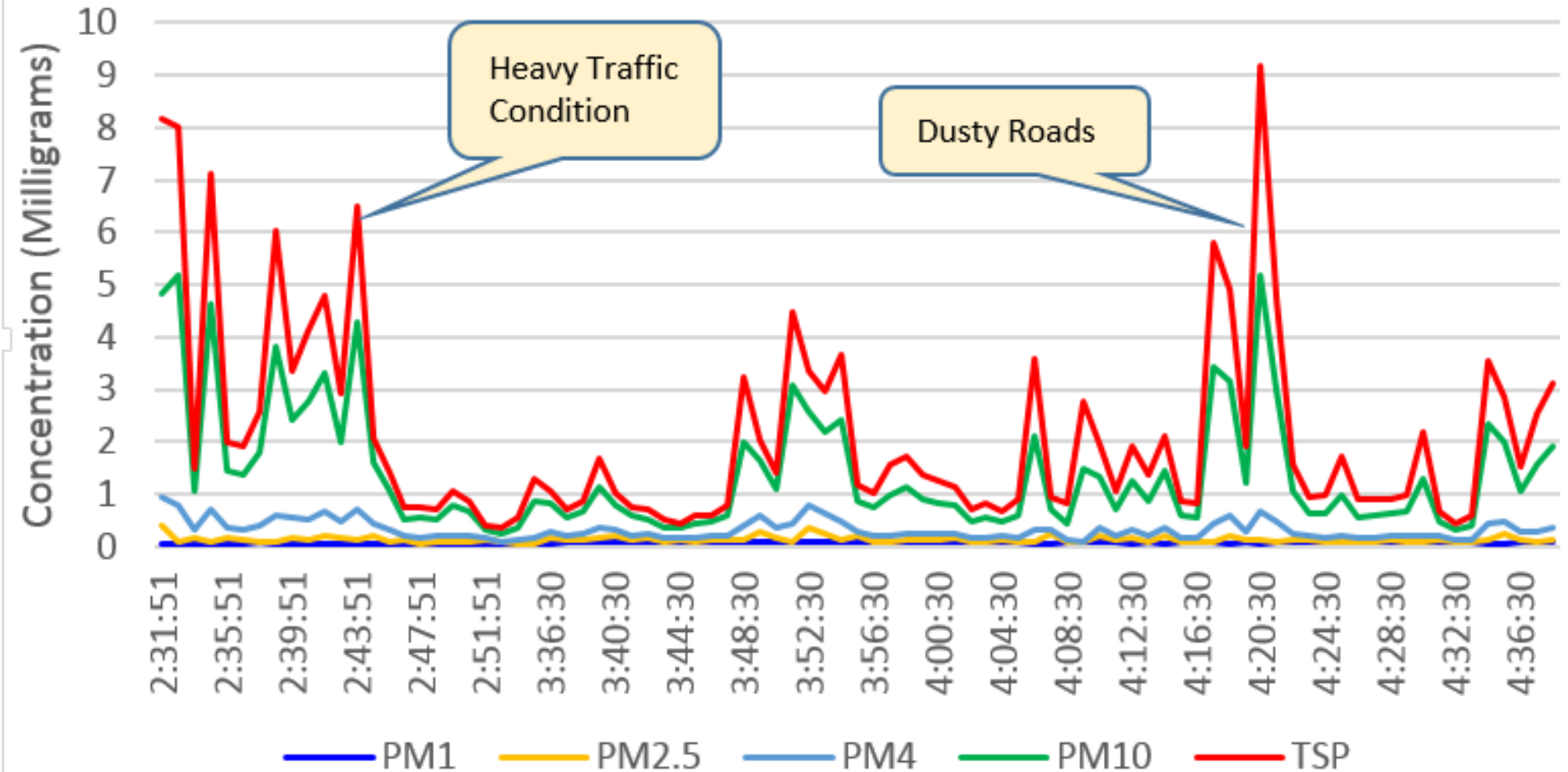
Relative Humidity %RH:

Min = 30.3

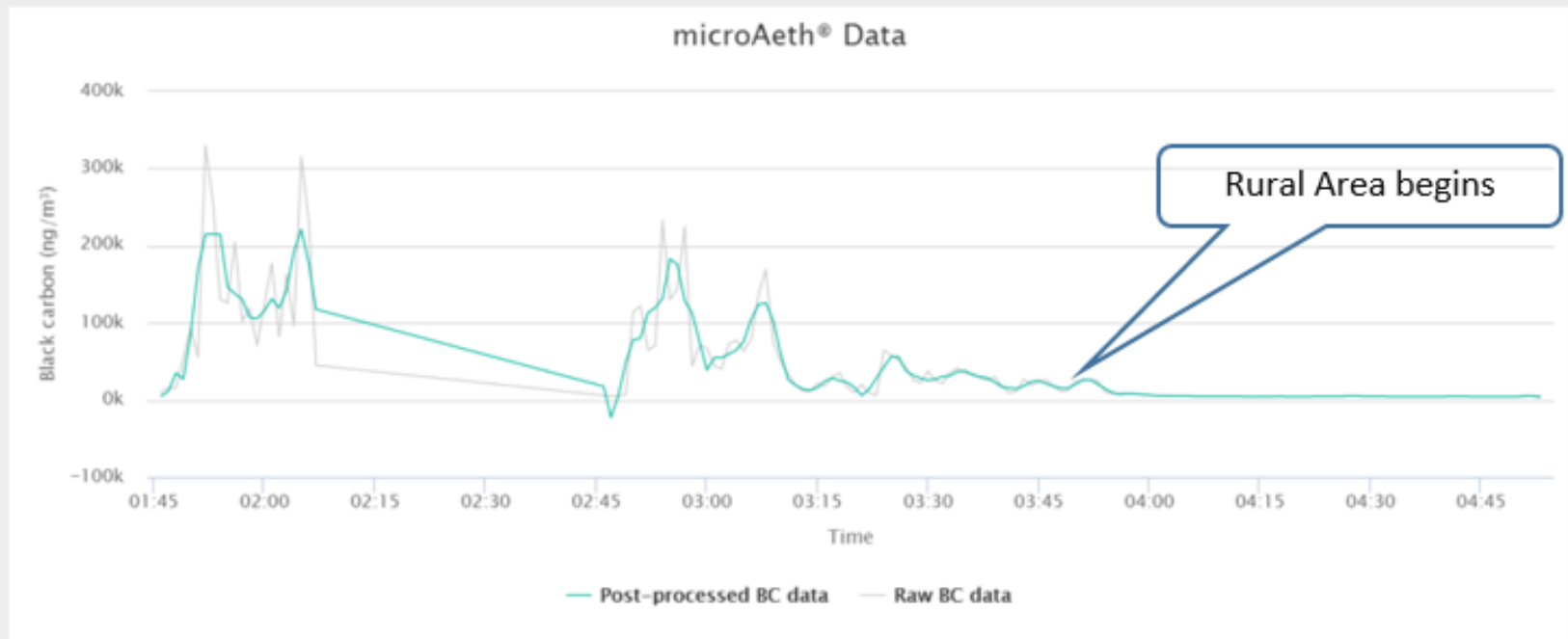
Max = 36.5

Average = 33.75

Particulate Matter Analysis



Data Analysis: MicroAeth



Settings

Application version: 2.2.4.0
Sample air flow rate: 99 ml/min
Sampling timebase: 60 seconds

Timing

Start time: Nov 5, 2015 - 1:45:00am +0000
End time: Nov 5, 2015 - 4:53:00am +0000
Total run time: 3 hours, 8 minutes

Analytics

Average BC concentration: 42477 ng/m³
Air flow per sampling period: 0.099 liters
Point-to-Point data variability: 12135 ng/m³ deviation
Deviation as BC increment: 16920.634 pg/cm²
Reference beam stability: 529 ppm stability
Average reference beam intensity: 916549 counts
Maximum sensing beam intensity: 915566 counts
Accumulation on filter strip this run: 110.609 attenuation

- Instruments hand-over to the participants

Thank You