

EPA Data Analysis and Monitoring  
Strategy – Transition to Recovery  
LATROBE VALLEY COAL MINE FIRES  
Version No. 5  
Date: 13 March 2014



# **EPA Data Analysis and Monitoring Strategy – Transition to Recovery LATROBE VALLEY COAL MINE FIRES**

**Draft Version No XXX.**

**Date: 13 March 2014**

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## 1. INTRODUCTION

### **Purpose**

The EPA Environmental Monitoring Programme has been designed to support the government's response and recovery efforts associated with the Hazelwood mine fire and the associated potential impacts upon the surrounding community and environment. The program details how EPA is designed to will acquire environmental quality data to support the responsible organisation to understand the potential for human health, occupational health and environmental consequences arising from the Hazelwood Mine Fire, through two phases, the incident phase, and the transition to recovery phase.

This Environmental Data is also made available to the community, with its posting on EPA's website.

In addition to the collation by EPA to provide a clear picture of the state of the environment in the area, the data and information gathered is provided to operational stakeholders to support decision making. As the incident transitions to recovery, EPA will continue its ambient monitoring program, and will continue the provision of expertise, advice and information to key stakeholders in support of their decision making.

### **End State**

A monitoring and data analysis regime that supports the de-escalation of the incident phase, and continues to build the body of knowledge of environmental quality and potential human health risks for Morwell and surrounds, while servicing the information needs of key stakeholders in recovery.

## 2. OVERVIEW – MONITORING REQUIREMENTS

### **Incident Summary**

The Hazelwood mine fire and the resultant smoke impact on the Morwell and surrounding communities have presented a unique set of circumstances for environmental monitoring and operational decision making. Historical EPA monitoring capability for fire situations has largely focused on particulate measurements to inform operational decisions. During this incident, EPA has steadily built from a platform of operational continuous monitoring, to multiple layers of testing and sampling. This supports a range of agencies activities, as well as the response to queries and anticipated queries from the community.

The monitoring, sampling and testing can be considered in four categories:

- 1. Event monitoring – initiated to gather information regarding peak smoke periods (eg. Smoke composition, Volatile Organic Compounds (VOCs) etc) – this will be continued until further peak events are no longer reasonably anticipated;
- 2. Impact monitoring – initiated to investigate and characterize direct environmental impacts by the fire and firefighting operations (eg. ash, soil and water sampling) – this will be continued until impacts appear to have stabilized or have significantly decreased and no further impacts can be reasonable anticipated;
- 3. Operational Support monitoring – initiated to support other agency decision making processes (eg. DoH Carbon monoxide (CO)e protocol, fire water sampling) – these will continue until we are notified that they are no longer an operational requirement, and may change through transition;
- 4. Ambient/background monitoring – expansion of existing program to understand broader air quality parameters – this will continue until sufficient data is collated to understand the air shed – expected to be at least one year.

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### **Transition/Recovery Summary**





As the incident is brought under control, the monitoring, testing and sampling regimes relating to event monitoring and impact monitoring will be accordingly scaled back. Activities that provide the baseline and background information will continue, and as operational needs are identified through the recovery phase, new monitoring, testing and sampling is expected to be implemented.

A decision framework, utilizing risk assessment, intelligence, environmental data, and its analysis, and liason with key stakeholders, CFA, DHS, DoH, Community etc. will be employed to support actions.

**3. EPA DECISION MAKING and OPERATIONAL PRIORITIES**

Strategic operational priorities for EPA through the transition are to:

- Scale back the event and impact based monitoring based on evidence, to that required to support the Regional Recovery Committee and relevant Sub-committees such as the *Health, Built Environment, and Natural and Agricultural* sub-committee;
- Continually review the support monitoring program to meet stakeholder needs;
- Continue the baseline and background monitoring to build sufficient data to understand long term environmental impacts of the incident.
- Maximise the transparency and timeliness of the monitoring program.

**Factors likely to be considered in decision making include:**

- Purpose of the monitoring;
- Intelligence (fire status);
- Data interpretation and analysis including trending;
- Risk assessment and contingency;
- Frameworks in place including plans , protocols; and
- Other agency and stakeholder needs or views.
- Actions will be taken in consultation with other agencies.

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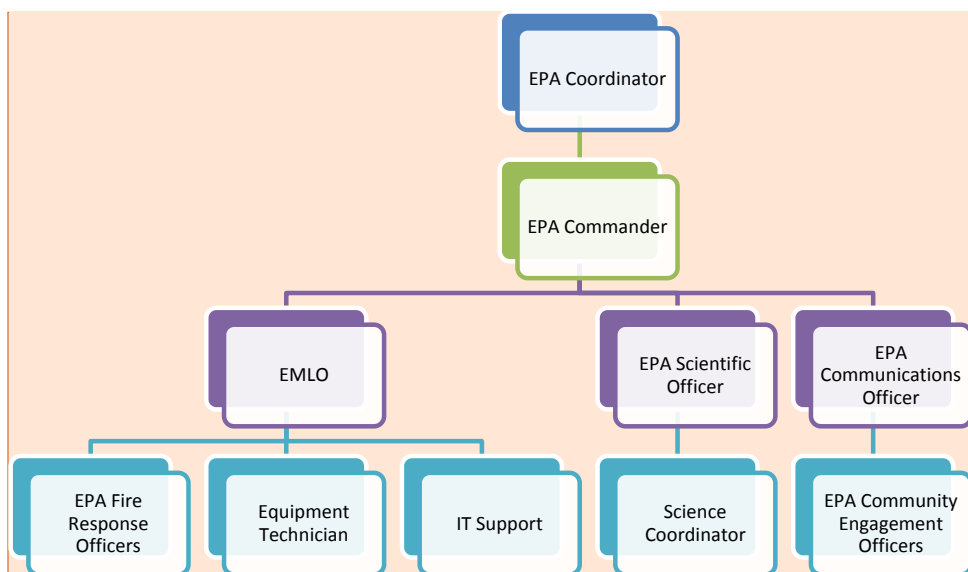


**4. MANAGEMENT ARRANGEMENTS**

**Resourcing - Incident**

**Traralgon RCC** – EPA Commander, EMLO and Scientific Officer roster, Field Officers Communications Officer, and Engagement Staff.

Roles:



**Comment [PH1]:** The role of Incident Coordinator, and how it interfaces with the structure shown should be included.

**EPA coordinator**

To provide strategic direction to the EPA commander and ensure resources required by the commander are available. To liaise with and provide information to other departments and government, on policy, implementation of EPA statutory obligations and strategic direction.

**EPA Commander (Agency Liaison)**

To provide strategie-tactical advice and commit EPA resources in support of Deputy Regional Controller and to coordinate EPAs effort in the RCC, and act as key liaison between emergency services and EPA. The commander provides oversight of other EPA staff in the RCC.

**Emergency Management Liaison Officer (EMLO)**

To provide advice and deploy EPA resources in support of COMMANDER

**Scientific Officer**

To provide technical advice and deploy data assets, construct a sustainable integrated data service, collate and analyse information, and provide information to Department of Health in support of human health decisions in accordance with RCC protocol

**Field Officers**

To provide on ground activities in support of operational plans and ad hoc requests under direction of EPA EMLO, staffed by Environment Protection Officers (Authorised Officers)

**Communications Officer**

To provide coherent messaging to community in support of the RCC Communications Team

**Engagement Staff**





To support communications plan in conjunction with other agencies including community engagement.

**Macleod Centre for Environmental Science - Forecasting and data analysis officer**

To collate data and analyse to produce regular air quality forecast reports and ad hoc analysis and information services requested by the RCC.

**Melbourne/Traralgon – Equipment Technician and IT**

**Equipment technician** – To provide commissioning, installation and servicing requirements for all EPA data assets under the direction of EMLO or Agency Liaison

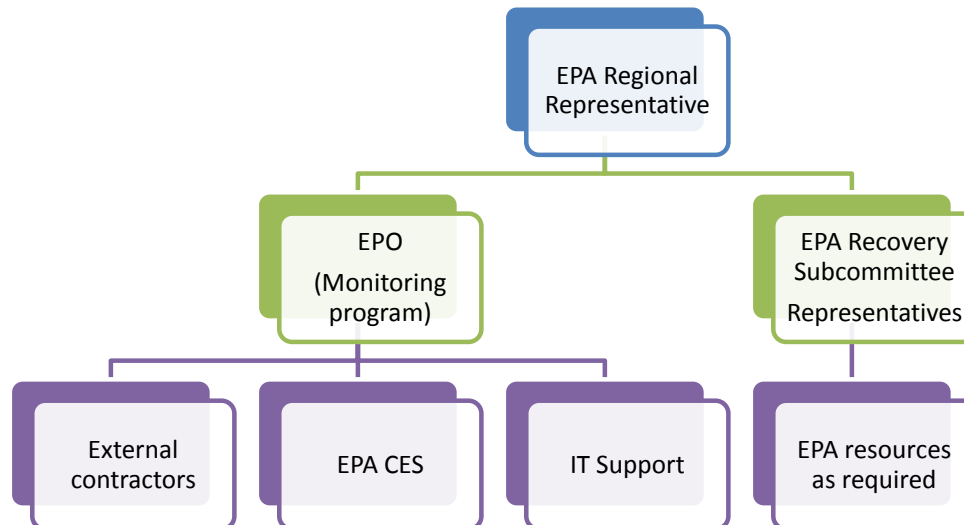
**IT Support** – To provide data integration and hardware/software support services under the direction of EMLO

**Science Coordinator** - To coordinate science activities as requested by the RCC across EPA Science, including interpretation, analysis and forecasting efforts.

**Resourcing – Transition/Recovery**

**Gippsland Regional Office – EPA Regional Representative, EPA Subcommittee Representatives, Environmental Protection Officers**

Whilst at this stage it is unclear the specific expectations and requirements of EPA service provision in support of the broader Regional Recovery Committee, it is assumed to be serviced from the Gippsland Regional Office. The remainder of the operation is focused on maintenance of the monitoring regimes which is anticipated to change from time to time.





## 5. MONITORING

- Note: This represents the existing monitoring program, and the current planned forward program based on EPA operational planning, and initial feedback from consultation with key stakeholders including DoH, DEPI and Latrobe City Council. This is expected to be regularly reviewed and updated.

### 5.1 AIR - Current

#### 5.1.1 Air Monitoring Stations (CO, PM 2.5, SO2) – EPA Sci Off

- There are three fixed air monitoring stations in the region at Morwell South & Morwell East (CO, PM2.5, SO2, wind speed and direction) and Traralgon (PM10, SO2, wind speed and direction). They continuously measure and transmit readings of specific pollutants to EPA data systems and the EPA Web Page. They provide real time information and are the key platform in assessing and responding to air quality events.
- This monitoring supports the following broad categories: 1, 2, 3 & 4.(see section 2 for explanation)

#### 5.1.2 Fixed PM2.5 Monitoring – EPA Sci Off

- Two indicative PM2.5 particle monitors are placed in a broader area of Morwell, as well as one each in Churchill and Moe to supplement Air Monitoring Station Data. Information from these monitors is used to track particle trends and provide a complete picture of plume behaviour. These stations may be redeployed depending upon data needs.
- This monitoring supports the following broad categories: 1, 2, 3 & 4.

#### 5.1.3 Portable CO monitoring – EPA Sci Off

- Monitoring sweep carried out as part of the smoke blanket mobile monitoring.
- This monitoring supports the following broad categories: 1 & 2.

#### 5.1.4 Smoke Blanket (instantaneous PM 2.5) mobile monitoring – EPA Sci Off

- EPA Tasmania (Smoke Trackers) are being used to assisting EPA Victoria to gather PM2.5 concentrations across the region utilising a vehicle mounted monitor (Travel Blanket). This information is graphically represented utilising Google Earth. Officers are working to correlate this data with handheld CO readings taken at regular intervals in the monitoring sweep.
- The Travel Blanket can be rapidly deployed to get a better picture of plume location relating to prevailing wind conditions and verify forecast conditions. Note this is a six second sample, not to be confused with the Mobile Lab hourly and twenty four hour average.
- This monitoring supports the following broad categories: 1 & 2.

#### 5.1.5 Air Toxics (Organics, dioxins, furans, MaH, PaH, BaP, suite of metals, pH, PM 10) Sampling – EPA Sci Off

- EPA has deployed air toxics canisters for event based monitoring of short term (24 hours) VOC and formaldehyde concentrations. These are deployed at three locations, two heavily impacted locations in Morwell South and one generally representative residential location in Morwell East. EPA has also deployed passive sampling tubes for VOCs to determine

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medium term (1 week) concentrations. These have been deployed in the same locations as the air toxics canisters. Location Morwell South.

- EPA has also deployed a high volume sampler for particle bound Polyaromatic hydrocarbons (PAH), semi-volatiles, dioxins and furans. Sampling is collected over a 24 hour event. – Location Morwell South.
- EPA has deployed a Partisol sequential sampler to collect PM10 and particles will analysed for metals for the purposes of particle characterisation; – Location Morwell South.

CSIRO will be undertaking puff high volume sampling for dioxins, furans and Persistent Organic Pollutants (POPs); obtain atmospheric samples of mercury and undertaking cascading filter sampling for metals and particle size – coordinated via Science Officer.

- [This monitoring supports the following broad categories: 1 & 2.](#)

#### 5.1.6 Indoor air quality (CO) monitoring – Gavin Fisher

- There was an indoor CO monitor installed at the Morwell Bowls Club to provide indicative data regarding the cumulative levels of CO indoors in Morwell. This has been removed.

- [This monitoring supports the following broad categories: 1 & 2.](#)

### 5.2 AIR - Transition/Recovery

It is currently anticipated that air monitoring is to be undertaken for a period of 12 months following the incident to gather sufficient data for parameters that have annual exposures standards and to reassure the community that air quality has returned to 'normal'. This will be reviewed after a 6 month period in consultation with DoH.

- [This monitoring supports the following broad categories: 3 & 4.](#)

#### 5.2.1 Morwell South

- Continue monitoring all current parameters (PM2.5, PM10, CO, SO2, NOx, O3, visibility, Hivol (PAHs), passive sampler VOC's)
- Addition of TEOM for PM10 measurements and removal of partisol.

Hivol (PAHs) continued due to annual average requirement for NEPM.

- [This monitoring supports the following broad categories: 1, 2, 3 & 4.](#)

#### 5.2.2 Morwell East

- Continue monitoring all current parameters (PM2.5, CO, SO2, visibility passive sampler VOC's)
  - [This monitoring supports the following broad categories: 1, 2, 3 & 4.](#)





**5.2.3 Traralgon**

- Continue monitoring all current parameters (PM2.5, PM10, CO, SO2, visibility).
- Addition of PM2.5 monitoring .

- This monitoring supports the following broad categories:1, 2, 3 & 4.

5.2.4 **Moe** – replace current temporary station (ADR) with PM2.5 BAM. This will allow us to correlate measurements between ADR instruments and collect higher quality particle measurements in the area.

This monitoring supports the following broad categories:1, 2, 3 & 4.

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5.2.5 **Churchill** – replace current temporary station (ADR) with PM2.5 BAM. This will allow us to correlate measurements between ADR instruments and collect higher quality particle measurements in the area.

This monitoring supports the following broad categories:1, 2, 3 & 4.

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**5.3 ASH and SOIL – Current**

**5.3.1 Dust Fall Gauges (Organics, MaH, PaH, BaP, suite of metals, pH)- Sci Off**

- There are four dust fall gauges at various locations across Morwell.
- This monitoring supports the following broad categories: 2& 3.

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**5.3.2 Soil sampling (Organics, MaH, PaH, BaP, suite of metals, pH) – EPA CES**

- Manual soil sampling is being undertaken on a weekly basis as part of the soil, water and ash monitoring program. These are used for two purposes; to determine an atmospheric deposition reference value (pre fire) and to assess if current ash fall out levels are impacting on soil quality.
- This monitoring supports the following broad categories: 2, 3 & 4

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**5.3.3 Ash & soil samples (Organics, MaH, PaH, BaP, suite of metals, pH) - EPA CES**

- Ash samples are being collected from within the environment as part of the weekly soil, water and ash monitoring program. These samples are then being analysed for pH, organic carbon, carbonates, metals, dioxins& furans and PAHs.
- This monitoring supports the following broad categories: 2 & 3

Comment [PH2]: This appears to duplicate the above?

**5.4 ASH and SOIL – Transition/Recovery**





#### 5.4.1 Ash Sampling

- Unless there are significant findings based on the existing program, or other pressing imperative, further ash sampling is not planned at this stage.
- This monitoring supports the following broad categories: 2 & 3

#### 5.4.2 Soil Sampling

- Unless there are significant findings based on the existing program, further soil sampling is not planned at this stage.
- This monitoring supports the following broad categories: 2 & 3

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#### 5.5 WATER - Current

##### 5.5.1 Wetlands, creeks and rivers (metals, organics and PAH) sampling – conducted by EPA CES.

- Weekly samples from freshwater bodies are being analysed for a number of parameters including metals, and Polycyclic Aromatic Hydrocarbons (PAH) to provide an understanding of impacts on waterways in Morwell and surrounds. This sampling will continue through the emergency response period.
- To give greater coverage of the period between sampling, EPA will deploy passive samplers to test for metals during the period between weekly sampling events.
- This monitoring supports the following broad categories: 2 & 3

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##### 5.5.2 Stormwater (suite of metals and PaH) sampling - conducted by EPA Sci Officer

- Stormwater sampling has occurred during/after rainfall events to determine if any contaminants present in the ash and air are present above levels expected in normal urban stormwater. Future sampling depends on rainfall but the intention is to collect samples up to three rain events. Based on air, ash and water sample results to date, the water analysis will cover metals and PAHs, but may be altered based on the results of the latest ash samples in for analysis.
- As stormwater runoff can be short-lived, EPA will deploy passive samplers for metals analysis to cover the periods between sampling events.
- This monitoring supports the following broad categories: 2 & 3

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##### 5.5.3 Rain Water Tanks - EPA Centre for Environmental Science (CES)

- EPA is sampling from rain water tanks in response to community concerns. This information is then being feed to Department of Health for assessment.

**Comment [PH3]:** The Health Dept have , a fact sheet concerning water tanks. Dept of Health confirmed there responsibility. The DoH are not recommending sampling.

##### 5.5.4 Fire water (suite of metals, organics, nutrients, algae, bacteria, surfactants) sampling – EPA Sci Off





- EPA is conducting sampling of dams on the Hazelwood Mine Site on Sunday/Tuesday/Thursday at the request of the CFA. This sampling is primarily to address potential OHS concerns regarding the quality of water being used to fight the fire. ▲

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- This monitoring supports the following broad categories: 2 & 3

## 5.6 WATER – Transition/Recovery

### 5.6.1 Wetlands, creeks and rivers (metals, organics and PAH) - sampling – conducted by EPA CES.

- Weekly samples from freshwater bodies are being analysed for metals, and Polycyclic Aromatic Hydrocarbons (PAH) to provide an understanding of impacts on waterways in Morwell and surrounds. This sampling will continue through the emergency response period.
- To give greater coverage of the period between sampling, EPA will deploy passive samplers to test for metals during the period between weekly sampling events. ▲

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- This monitoring supports the following broad categories: 2, 3 & 4

### 5.6.2 Stormwater sampling (metals, organics and PAH) - EPO

- Stormwater sampling has occurred during/after rainfall events to determine if any contaminants present in the ash and air are present above levels expected in normal urban stormwater. Future sampling depends on rainfall but the intention is to collect samples after three rain events. Based on air, ash and water sample results to date, the water analysis will cover metals and PAHs.
- Following a number of storm sampling events, if no impacts are detected above those typically observed in an urban environment this will be discontinued as it will indicate any impacts resulting from the fires have abated. ▲

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- This monitoring supports the following broad categories: 2, 3 & 4

### 5.6.3 ~~Rain Water Tanks – EPA CES~~

- ~~EPA is sampling from rain water tanks in response to community concerns. This information is then being fed to Department of Health for assessment. Once the emergency event has stopped and rainfall has occurred, sampling of rainwater tanks can cease, as the source of potential contamination will have stopped.~~

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### 5.6.4 Fire water – EPA Sci Off

- Fire water sampling will cease with the completion of the involvement of emergency services in the response, or earlier following consultation with CFA, DoH etc. ▲

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- This monitoring supports the following broad categories: 2 & 3

- 





## 6. Other Data Sources

### 6.1 Area Rae CO data collection - CFA

- ~~These will be demobilised at the request of DoH~~ **and in consultation with CFA** when they are no longer required to service the CO Protocol.
- 

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### 6.2 Spot Fire Weather Forecast for Morwell - BOM

- Received from BOM at approx. 5 AM and 5 PM each day. The detailed forecast from BOM is used to predict location and extent of plumes – will continue on an as needs basis.

### 6.3 Smoke dispersion guidance - CFA

- Received from the fire behaviour scientist for CFA (ICC-Hazelwood (Planning Section)) will cease at the completion of the incident

## 7. Analysis, Forecasting and Reporting

### 7.1 Analysis

#### 7.1.1 Air

##### • CO, PM2.5, PM10, SO2 and Visibility

Air quality monitoring data is assessed against levels set by the State Environment Protection Policy (Ambient Air Quality) and the Ambient Air Quality National Environment Protection Measure (AAQ NEPM) air quality standard.

##### • Air Toxics

The data obtained ~~from the air toxic canisters and passive sampling tubes~~ will be compared against the National Environment Protection (Air Toxics) Measure 2004 & other international standards by EPA & DoH..

#### 7.1.2 Water

##### • Fresh water bodies

EPA will analyse data from freshwater bodies across the region to determine if the ongoing situation is have impacts on water quality. This data will be assessed against the requirements of the State Environment Protection Policy (Waters of Victoria) 2003 and the Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC) 2000.

##### • Onsite dams (Hazelwood)

EPA will provide the analysis results from the onsite water bodies to ~~an Occupational Hygienist engaged by fires services~~ for analysis against relevant occupational exposure limits.

##### • Rain water tanks

~~Data from analysis of water samples from rain water tanks will be supplied to the Department of Health for analysis against the Australian Drinking Water Guidelines (2011).~~

Comment [PH4]: DoH incident commander, Road DedmaN confirmed against





### 7.1.3 Ash

Data analysis of ash and reference soil is being passed to Department of Health.

### 7.2 Forecasts

- EPA will issue daily Air Quality Forecasts at 8:30 and 17:20 until the completion of the incident.

### 7.3 Reporting

- EPA issues 12 hourly Air Quality Monitoring Reports every day at 8:30 and 17:30 and will continue until completion of the incident.
- Data from the fixed monitoring locations at Morwell South, Morwell East and Traralgon is updated hourly at <http://www.epa.vic.gov.au/aq-latrobe-valley-mine-fire/current-air-quality> with information calculated on data readings averaged over eight hours for carbon monoxide, 24 hours for PM<sub>2.5</sub> and one hour for PM<sub>10</sub>.

## 8. PERFORMANCE MEASURES

### 8.1 Reports and Forecasts

Timely provision of reports and forecasts twice per day to [CFA](#), [DHS](#) and DOH and others.

### 8.2 Data Availability (to EPA Science Officers)

Availability of data (95 %)

Response to equipment failure – Variable, 3-4 hours during business hours, next business day other times.

### 8.3 Data Availability (to Public)

90 % of hourly air quality updates available to the public in real time on the EPA web site.



