

行政院所屬各機關因公出國人員出國報告書  
(出國類別：國際會議)

2012 年國際空氣品質監測研討會

服務機關：行政院環境保護署

姓名職稱：陳映竹薦任技佐

鐘椀亭特約環境監測技術師

派赴國家：美國

出國時間：101 年 5 月 13 至 18 日

報告日期：101 年 8 月

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## 參加 2012 年國際空氣品質監測研討會出國報告摘要

本次行程主要參加位於美國科羅拉多州丹佛市舉辦的第 2 屆 2012 年國際空氣品質監測研討會，會議係由美國協會空氣清淨機構（NACAA）與美國環保署 (US EPA) 合辦，該會為空氣品質監測領域重要之全球性學會。會議期間約有 10 多國家 300 多人參加，發表約 100 餘篇論文。我國亦有發表(懸)浮微粒空氣品質監測之海報論文「15-year Distribution of Suspended Particulate Matters (PM10 and PM2.5) in Taiwan」，此研究議題引起各國與會學者的高度興趣。

此次研討會主題包含懸浮微粒監測及操作、最新監測技術、空氣品質監測資料傳輸應用等重要成果，參與人員領域也涵括建築、公衛、職安衛、機械、資訊、空調、土木、環醫、環科與環工等多領域學者專家，使得研討會的氣氛特別多元。報告者亦來自德國、英國、瑞典、丹麥、香港、中國、埃及、瑞士、澳大利亞、日本、韓國等超過 30 多個國家或地區，而本次由我國環保署代表出席此國際會議，大幅提升我國國際視野。

整體而言，本次的國際會議除了如過去參與國際會議攜回國際頂尖研究資料外，也逐漸轉移到「展示台灣的研究能量」與「國際接軌共同合作」等，提高了台灣空氣品質監測實力的能見度，並能進一步「喚起國際社會對台灣的認同」。



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# 一、會議背景及目的

## (一)背景

2012 年國際空氣品質監測研討會於 2012 年 5 月 13 日至 18 日，在美國科羅拉多丹佛市(Denver)一連舉行 6 天，超過 300 位的學者專家、業界和政府等代表與會，近 100 篇研究論文在本次會議中被發表。值得一提的是，我國除積極參與會議討論外，亦發表海報論文「15-year Distribution of Suspended Particulate Matters (PM<sub>10</sub> and PM<sub>2.5</sub>) in Taiwan」，確實提升了台灣在本次國際會議上之能見度。

本次會議由各科學領域之學者專家、產業先進和政府代表們，以更寬廣和深思熟慮的態度，提出他們對於改善空氣品質之技術見解和政策說明。而這些研究成果在彼此討論交換下，不僅能檢視於傳統經濟地區、國家、國際等之環境保護議題上，亦可適用於經濟為開發中的國家。大會希望藉由科學知識的推進和技術的發展，進而增進對空氣污染的預防和控制，最後達到環境保護之永續發展。

由於本會議之議題相當廣泛，因此本報告內容的主軸，將針對大會所區分之操作懸浮微粒 PM<sub>2.5</sub> 連續自動監測方法(FEMs)的最佳操作經驗、美國空品標準更新與監測站網、環境空氣監測數據趨勢、自動化數據傳輸路徑(AQS 與 AIRnow)、監測方法(VOC 與 NO<sub>y</sub>)等多項議題加以彙整、說明，除了有助於了解目前世界各國對該議題之研究技術發展和政策執行動向外，亦可作為本署未來相關議題政策制定或執行之參考。

## (二)目的

參加此國際會議將有助於瞭解國際間最新研究、監測成果及相關法規制定情形，作為本署未來監測技術改良及相關策略制定參考，屆時整合我國現行空氣品質監測技術。

### 三、會議過程說明

2012 年國際空氣品質監測研討會(National Air Quality Conference-Ambient Monitoring 2012)議題包括操作懸浮微粒 PM<sub>2.5</sub> 連續自動監測方法(FEMs)的最佳操作經驗、美國空品標準更新與監測站網、環境空氣監測數據趨勢、自動化數據傳輸路徑(AQS 與 AIRnow)、監測方法(VOC 與 NO<sub>y</sub>)等多項議題，行程及摘要內容如下：

5/13	啓程，台北前往美國科羅拉多丹佛市
5/14	1.報到 2.參加主題系列演講 <ul style="list-style-type: none"><li>• Monitoring Method</li><li>• Best Practice for Operating PM<sub>2.5</sub> Continuous FEMs</li></ul> 3.投稿海報參展
5/15	1.參加主題系列演講 <ul style="list-style-type: none"><li>• NAAQS Updates and Monitoring Networks</li><li>• Ambient Air Data Trends</li><li>• Office of Research and Development Monitoring and Methods Priorities</li></ul> 2.參加海報展覽專區
5/16	1.參加主題系列演講 <ul style="list-style-type: none"><li>• Assessments &amp; Special Studies</li><li>• Data Roadmap &amp; Automation</li><li>• New &amp; Emerging Monitoring Technologies</li></ul> 2.參加海報展覽專區
5/17	1.參加主題系列演講 <ul style="list-style-type: none"><li>• Technical Program Updates</li></ul>



	<ul style="list-style-type: none"> <li>Questions &amp; Answers with Monitoring Managers</li> </ul> 2.下午返程
5/18	返程，由美國科羅拉多丹佛市返回台北

### 三、會議內容重點整理

#### (一) (細)懸浮微粒相關法規






懸浮微粒(particulate matter)相關法規主要仍以空氣品質標準之規範為主，彙整我國環保署(EPA)及美國環保署(US EPA)針對(細)懸浮微粒之品質標準如表 1 所示。我國環保署目前僅規範總懸浮微粒(TPS)及懸浮微粒(PM<sub>10</sub>)，細懸浮微粒(PM<sub>2.5</sub>)相關規範仍在擬定中；但美國環保署則僅針對懸浮微粒(PM<sub>10</sub>)及細懸浮微粒(PM<sub>2.5</sub>)規範，細分為日平均值(或 24 小時值)及年平均值兩類。探討兩國均有規範之懸浮微粒(PM<sub>10</sub>)，顯示我國日平均值 125  $\mu / m^3$  較美國 24 小時值 150  $\mu / m^3$  嚴格；但在年平均值部分，則以我國年平均值 65  $\mu / m^3$  較美國環保署年平均值 50  $\mu / m^3$  寬鬆。

針對空氣品質部分，目前美國仍以空氣品質指標(AQI)作為評量，而我國亦參考 AQI 擬定空氣污染指標(PSI)，並將其由六級簡化成五級(如表 2 所示)。其中針對在粒狀物部分，美國環保署除規範懸浮微粒(PM<sub>10</sub>)外，亦向下規範細懸浮微粒(PM<sub>2.5</sub>)，而目前我國針對粒狀物僅規範懸浮微粒(PM<sub>10</sub>)，其規範值略低於美國。

表 1、空氣品質標準比較

項目	EPA		US EPA	
	日平均值 ( $\mu/m^3$ )	年平均值 ( $\mu/m^3$ )	24 小時值 ( $\mu/m^3$ )	年平均值 ( $\mu/m^3$ )
TSP	250	130	--	--
PM <sub>10</sub>	125	65	150	50
PM <sub>2.5</sub>			65	15

表 2、美國及我國環保署公告之懸浮微粒空氣污染指標值對照表

Index		Category		PM <sub>2.5</sub> ( $\mu g/m^3$ )		PM <sub>10</sub> ( $\mu g/m^3$ )	
U.S.A EPA (AQI)	EPA (PSI)	U.S.A EPA	EPA	U.S.A EPA	EPA	U.S.A EPA	EPA
0 - 50	50	Good Green	Good 	0.0 - 15.4	—	0 - 54	50
51 - 100	100	Moderate (Yellow)	Moderate 	15.5 - 40.4	—	55 - 154	150
101 - 150	200	Unhealthy Orange for sensitive groups	Unhealthful 	40.5 - 65.4	—	155 - 254	350
151 - 200		Unhealthy Red		65.5 - 150.4		255 - 354	
201 - 300	300	Very unhealthy Purple	Very unhealthful 	150.5 - 250.4	—	355 - 424	420
301 - 400	400	Hazardous	Hazardous 	250.5 - 350.4	—	425 - 504	500
401 - 500	500			350.5 - 500.4	—	505 - 604	600

## (二) (細)懸浮微粒監測技術

(細)懸浮微粒監測技術主要可分為三大類，包括慣性質量法、貝他射線衰減法及雷射光譜法，其中慣性質量法及貝他射線衰減法均可用於懸浮微粒(PM<sub>10</sub>)及細懸浮微粒(PM<sub>2.5</sub>)，且 R&P、MetOne 及 Andersen 等儀器已通過環保署認證。雷射光譜法則為較新引的技術，可同時測量多種不同粒徑微粒之濃度，具有十分廣泛的運用性。現就此三大類監測技術分述如下：

### 1. 慣性質量法

- (1) 方法概要：空氣中的粒狀污染物經由粒徑篩分器，以適當的吸引量採集到濾紙上，濾紙直接裝在擺動式錐狀微量天平上，直接測出瞬間重量的變化，再經儀器自動換算出即時濃度值。
- (2) 適用範圍： $0\sim 5\times 10^6 \mu\text{g}/\text{m}^3$ 。
- (3) 主要元件：粒徑篩分器及分流器、慣性質量監測元件、控制單元、真空吸引泵。

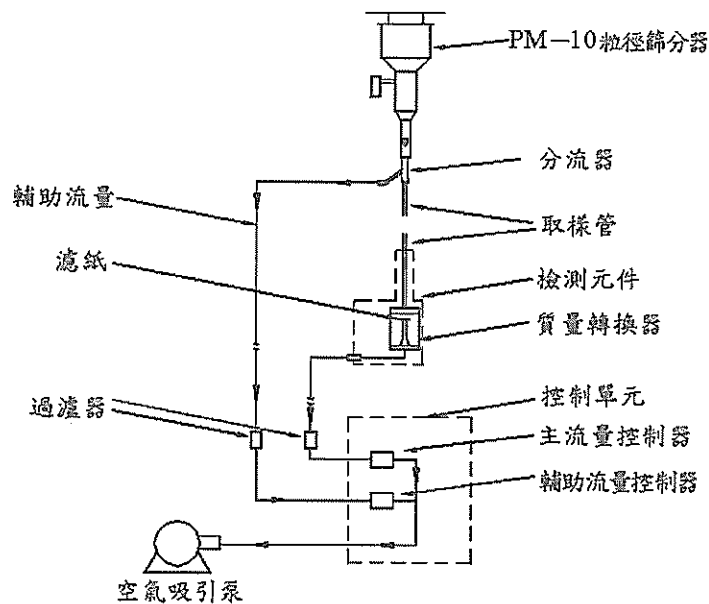


圖 1、系統氣體流程示意圖

## 2. 貝他射線衰減法

- (1) 方法概要：以貝他射線照射捕集微粒之濾紙，量測採樣前後貝他射線通過濾紙之衰減量，再根據其微粒濃度與輻射強度衰減比率關係由儀器讀出空氣中粒狀污染物的濃度。
- (2) 適用範圍： $0\sim 1\times 10^4 \mu\text{g}/\text{m}^3$ 。
- (3) 主要元件：採樣器、採樣濾紙移動裝置、貝他射源、偵測器、電腦系統、應有大氣壓力與溫度量測。

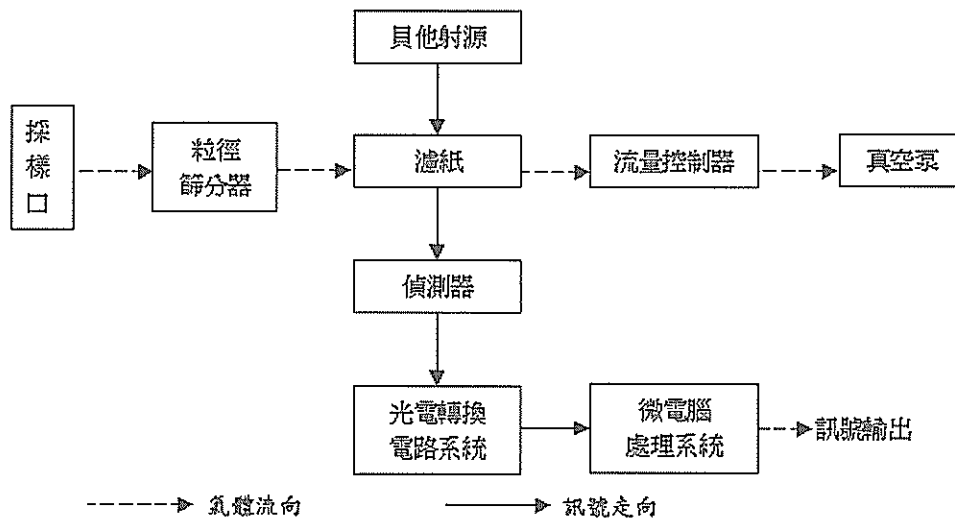


圖 2、貝他射線衰減法自動分析儀器示意圖

### 3. 雷射光譜法

(1) 方法概要：利用光譜散射技術作單一微粒的計數，藉由 semiconductor-laser 為光源，當微粒通過雷射照射通道，其所散射的訊號以 90 度的反射鏡收集並傳輸至 recipient-diode。通過 diode 的訊號經增幅後再以波高分析器將訊號分類至不同粒徑。測得數據可儲存在記憶卡中，也可透過 RS 232 傳送作進一步分析。

(2) 適用範圍：0.3~20  $\mu\text{g}/\text{m}^3$ 。

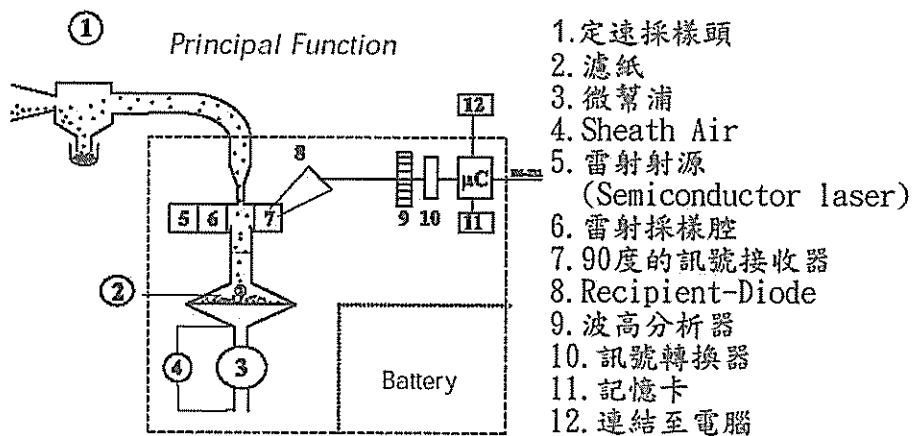


圖 3、GRIMM1.108 微粒流向示意圖

### (三) 美國細懸浮微粒監測現況

截至 2012 年 5 月為止，美國環保署完成自動監測 PM<sub>2.5</sub> 國家空氣品質標準 (NAAQS) 審查 80 站次的分析與數據，其中 Met One BAM 1020 為 61 站、Thermo Series 8500C FDMS 為 17 站、Thermo 5030 SHARP 為 2 站 (簡報 P11，<http://www.epa.gov/ttn/analysis/pm.htm>)，目前空品系統 (AQS) 有 FEMs 認證的自動監測站分布如簡報 P4，全部 PM<sub>2.5</sub> 自動監測站則如簡報 P5 (包括無 FEMs 認證站)，通過審查及認證的儀器，皆以 Met One BAM 1020 為主。

而特別領域的 PM<sub>2.5</sub> FEMs 認證的儀器操作維護方面，Met One BAM 1020 需做零點測試，FDMS 則至少每年維護乾燥器。

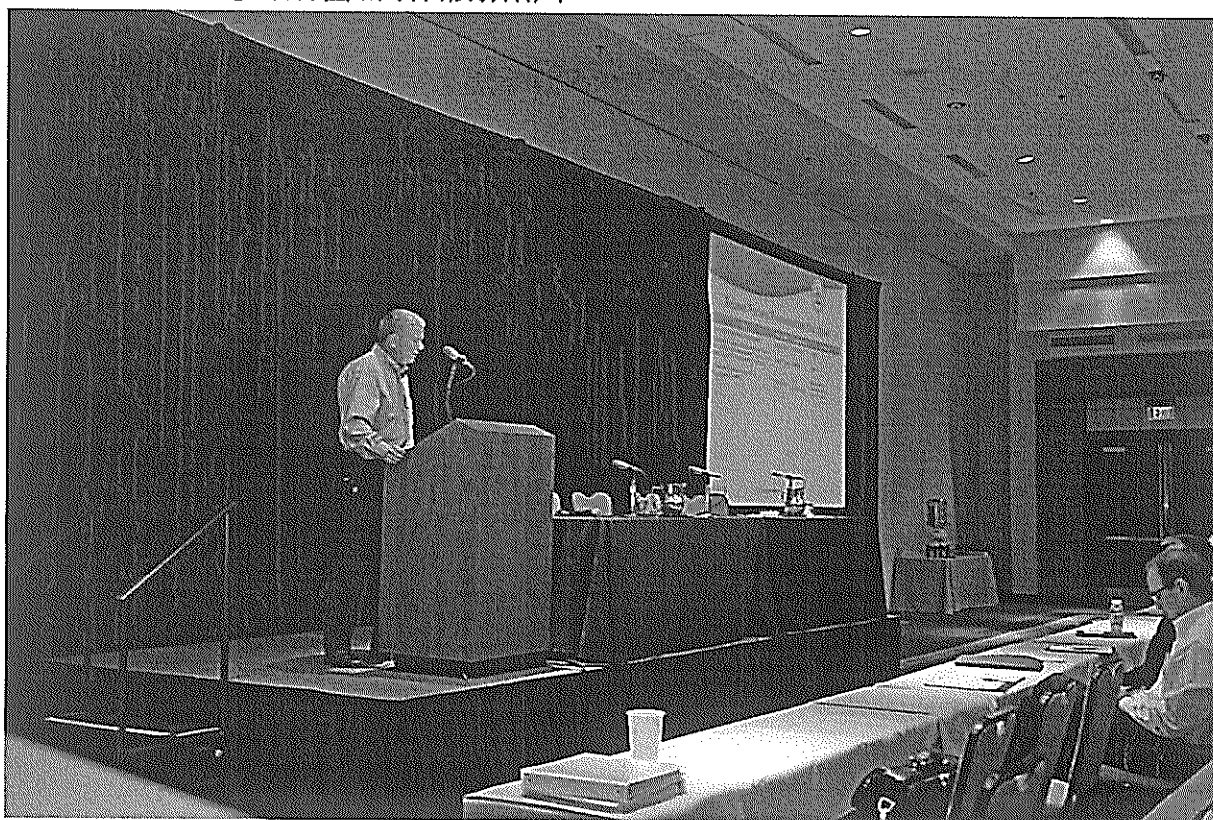
## 四、參加會議心得摘要

- (一) 本次會議共有 10 多個國家參加，超過 300 位的學者專家、業界和政府等代表與會，近 100 篇研究報告被發表。值得一提的是，台灣除積極參與會議討論外，亦發表海報論文「15-year Distribution of Suspended Particulate Matters (PM<sub>10</sub> and PM<sub>2.5</sub>) in Taiwan」，大大提升了台灣在本次國際會議上之能見度，同時也讓與會各國代表了解，臺灣對相關環境污染問題所做之努力與貢獻。未來應多鼓勵或獎勵，受經費補助之研究或執行單位，都能將研究成果踴躍投稿於各國際會議上。
- (二) 本次大會議題廣泛，包含懸浮微粒監測及操作、最新監測技術、空氣品質監測資料傳輸應用等十多個主題領域。為了達到觀摹與學以致用，本報告將值得我們借鏡與參考的事項，直接整理於每項議題之參考借鑑與建議欄內，期望對於國內未來相關空氣污染的研究、政策的擬訂與執行，能有很大的助益。
- (三) 綜合此次國際環保會議，感覺到國際間，不論是新技術的開發或是政策觀念的倡導，都有顯著的進步。環境污染問題是不分中央與地方的，需一起共同努力，有效整合各部會之意見，是我國未來必須努力加強方向。

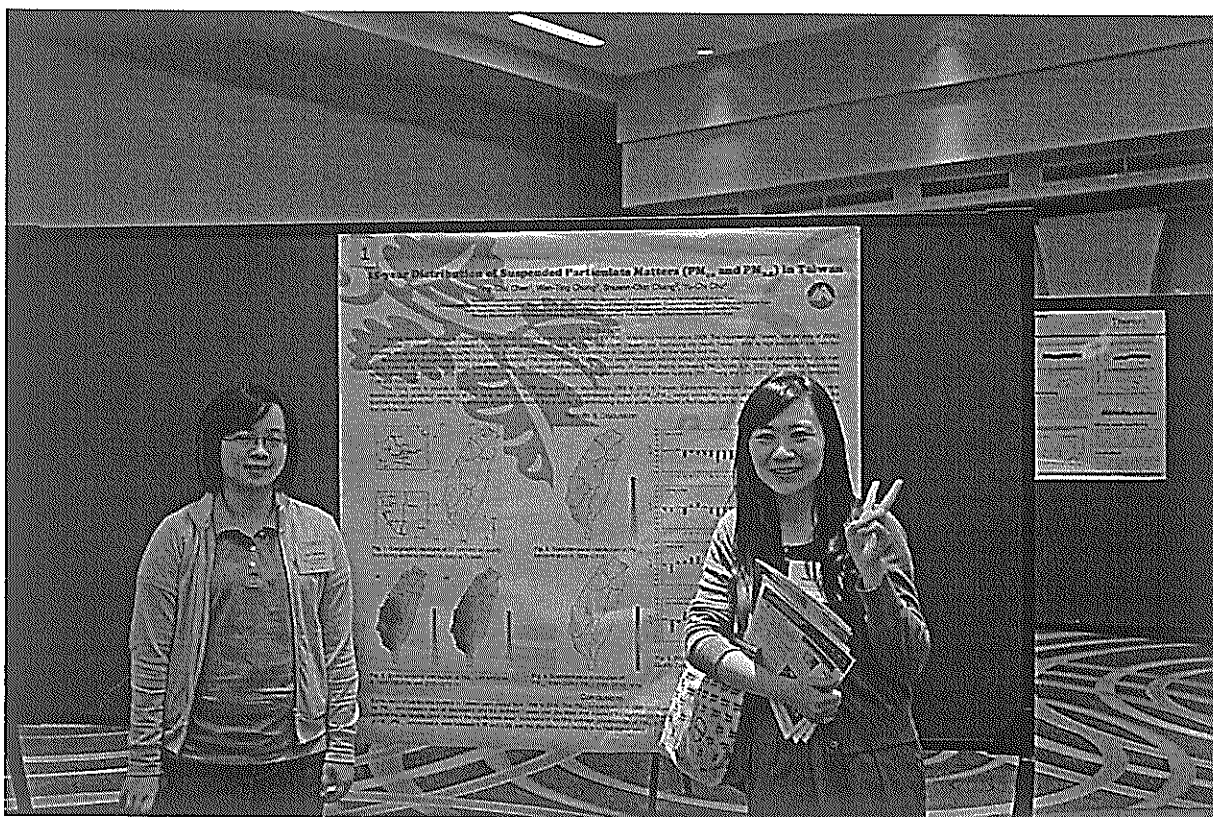
## 五、建議事項

- (一) 國際交流均以英文為主，因此相關介紹我國空氣品質監測工作、資料和計畫之內容須提供英文版本，以促進實質交流。
- (二) 未來應持續推展本署目前空氣品質、(細)懸浮微粒及重金屬等測站監測成果，並多參與專業研討活動，以增加我國環境監測作業在國際舞台之能見度，並加以收集國外先進國家相關技術經驗。
- (三) PM<sub>2.5</sub> 污染監測問題是各國關切的目標，本次美國環保署分享之範例，PM<sub>2.5</sub> 手動採樣數據與自動監測數據比對已達 530 筆，並指出各季節比對數據相關性不同，我國應持續進行 PM<sub>2.5</sub> 手動採樣監測，效法美國經驗。

## 附件一 參加會議相關照片



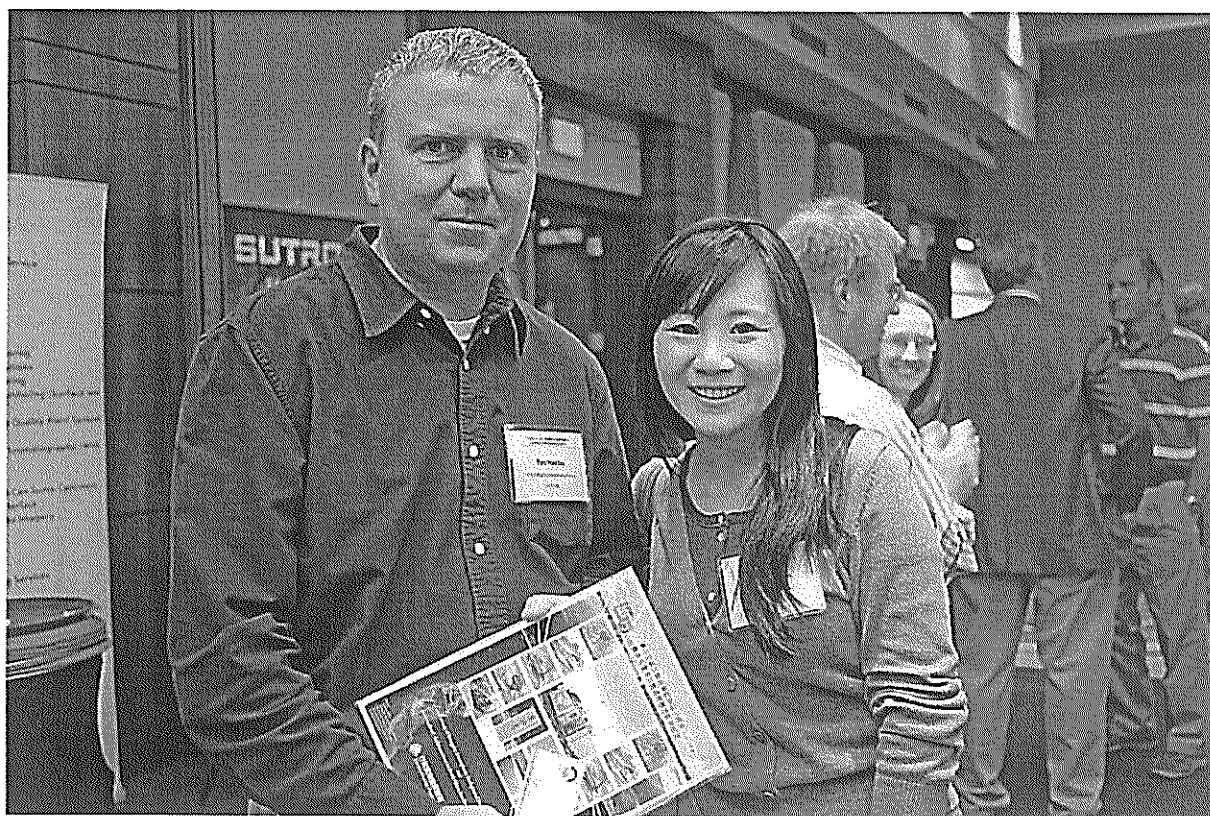
美國環保署 PM<sub>2.5</sub> 監測專家 Tim Hanley 專題演講



與本署投稿之海報合影



與美國環保署專家 Laurie J. Trinca 合影



與美國環保署專家 Tim Hanley 合影



National Air Quality Conference – Ambient Monitoring 2012

SUNDAY, MAY 13, 2012 –EARLY REGISTRATION

5:00pm – 7:00pm

Registration

MONDAY, MAY 14, 2012 –TRAINING SESSIONS

7:00am – 8:00am

Registration

12:00pm – 5:00pm

Vendor Set Up

<p><b>Air Toxics Data Analysis Room – Denver I</b> <i>Hilary Hafner &amp; Mike McCarthy - STI</i></p>	<p><b>Commercial Data Systems Room - Colorado F</b> <i>Lewis Weinstock – EPA/OAQPS</i></p>	<p><b>Quality Assurance Training Room – Colorado G</b> <i>Michael Papp – EPA/OAQPS &amp; Donovan Rafferty – WA Dept of Ecology</i></p>
<p><b>8:00am – 12:00pm</b></p> <p>This half day course will provide an overview of the topic of air toxics data analysis; provide suggestions on methodology to use in analyzing air toxics data; help participants to quantify and interpret data and trends, and provide real examples or application.</p>	<p><b>8:00am – 12:00pm</b></p> <p>This session will examine how various States have used commercial data systems to gain operational efficiencies and how agencies have optimized processing of data.</p> <p><i>George Erdman, Northern Sonoma County APCD Jennifer Bradley, Polk County IA Air Quality J.B. Dennison, SLR International Corp Mark Stoelting, Bay Area AQMD Alan Chan, Sonoma Technology, Inc.</i></p>	<p><b>8:00pm – 12:00pm</b></p> <p>This session will provide ambient air monitoring quality assurance requirements contained in 40 CFR Part 58 Appendix A as well as covering Federal QA requirements including the ambient air QA requirements for SLAMS/SPM/PSD monitoring. Training will also be provided on the various quality control samples for each criteria pollutant including their frequency of collection and how they should be reported, the statistics for assessing data quality, and the tools available including the Data Assessment Statistical Calculator and the AMP 255 report. This training event is intended for personnel needing an initial understanding of the ambient air quality system and those wanting an update on the changes that have taken place over the years.</p>
<p><b>12:00pm – 1:30pm LUNCH – on your own</b></p>		
<p><b>Monitoring Methods Room – Denver I</b> <i>Joann Rice – EPA/OAQPS</i></p>	<p><b>Best Practices for Operating PM<sub>2.5</sub> Continuous FEMs Room – Colorado F</b> <i>Tim Hanley – EPA/OAQPS</i></p>	<p><b>AQS/Discoverer/Data Mart Training Room – Colorado G</b> <i>Chris Chapman – EPA/OAQPS</i></p>
<p><b>1:30pm – 5:00pm</b></p> <p><b>1:30pm</b> VOC collection systems – <i>Dave Shelow, EPA, Office of Air Quality Planning &amp; Standards</i>  <b>2:30pm</b> Evaluation of the Thermo 146i Calibrator – <i>Rebecca Peltzer, Polk County, Iowa Air Quality</i>  <b>3:00pm</b> Sunset Carbon – <i>David Smith, Sunset Labs &amp; Beth Landis, EPA/OAQPS</i>  <b>4:00pm</b> NOy Issues, <i>Nealson Watkins &amp; Mark Shanis – EPA Office of Air Quality Planning &amp; Standards</i></p>	<p><b>1:30pm – 5:00pm</b></p> <p>This session will include updates on the most important operational practices necessary to provide data of optimum quality. New data tools for assessing FRM – FEM performance will also be discussed.</p>	<p><b>1:30pm – 5:00pm</b></p> <p>AQS is EPA's database of ambient air pollution data collected by EPA, state, local, and tribal air pollution control agencies from thousands of monitoring stations. AQS also contains meteorological data, descriptive information about each monitoring station (including its geographic location and its operator), and data quality assurance/quality control information. Learn how to retrieve data from AQS by a variety of tools (AQS Reports, AQS Data Mart, and how you can build your own database queries using Oracle Discoverer).</p>

# National Air Quality Conference – Ambient Monitoring 2012

TUESDAY, MAY 15, 2012 – PLENARY SESSION – COLORADO BALLROOM F

7:00am – 8:00am Registration and Refreshments

8:00am - 8:15am	<b>Region 8 Welcome</b> <i>Howard Cantor, EPA Region 8 Deputy Regional Administrator</i>
8:15am – 8:30am	<b>EPA Welcome &amp; NACAA Welcome</b> <i>Richard Wayland, Division Director, Air Quality Assessment Division, EPA Office of Air Quality Planning &amp; Standards</i> <i>Dick Valentineti, Director of the Vermont Air Pollution Control Division</i>
8:30am – 8:45am	<b>OAR Senior Management Perspective</b> <i>Janet McCabe, Deputy Assistant Administrator, EPA Office of Air and Radiation</i>
8:45am – 9:30am	<b>NAAQS Updates and Monitoring Networks</b> <i>Lewis Weinstock, Group Leader, Ambient Air Monitoring Group, EPA Office of Air Quality Planning and Standards</i>
9:30am – 10:00am	<b>Ambient Air Data Trends</b> <i>Pat Dolwick, Group Leader, Air Quality Analysis Group, EPA Office of Air Quality Planning &amp; Standards</i>
10:00am -10:30am	<b>BREAK (Refreshments in Exhibit Areas)</b>
10:30am – 11:15am	<b>Office of Research and Development Monitoring and Methods Priorities</b> <i>Russell Long, EPA Office of Research &amp; Development</i> <i>Tim Watkins, EPA Office of Research &amp; Development</i>
11:15am – 12:00pm	<b>FEATURED SPEAKER: Using Ambient Air Pollution Monitoring Data: The Denver Aerosol Sources and Health Study (DASH)</b> <i>Dr. Jennifer Peel, Colorado State University</i>
12:00pm – 1:30pm	<b>LUNCH – on your own</b>
1:30pm – 3:00pm	<b>NO<sub>2</sub> Near-Road Pilot Study Lessons Learned – Panel Discussion</b> <i>Neelson Watkins, EPA Office of Air Quality Planning &amp; Standards</i> <i>Rich Baldauf, EPA Office of Research and Development &amp; Office of Transportation &amp; Air Quality</i> <i>Monica Pognon, Broward County FL Environmental Protection Department</i> <i>Bruce Louks, Idaho Department of Environmental Quality</i>
3:00pm – 3:30pm	<b>BREAK (Refreshments in Exhibit Areas)</b>
3:30pm - 4:00pm	<b>Region 1 New England Network Assessment</b> <i>Robert Judge, EPA Region 1</i>
4:00pm –5:00pm	<b>Other EPA Monitoring Programs:</b> <i>Radnet, Dan Askren, EPA Office of Radiation &amp; Indoor Air</i> <i>Clean Air Status &amp; Trends Network (CASTNET), Tim Sharac, EPA Office of Atmospheric Programs</i> <i>Interagency Monitoring of Protected Visual Environments (IMPROVE), John Vimont/Bret Schichtel, National Park Service</i> <i>National Atmospheric Deposition Program (NADP), David Gay, NADP</i>
6:00pm – 8:00pm	<b>Poster Session/Reception – Colorado E; Denver IV &amp; Registration Area</b>

# National Air Quality Conference – Ambient Monitoring 2012

## WEDNESDAY, MAY 16, 2012 – TECHNICAL SESSIONS

7:00am – 8:00am

Registration & Refreshments

Assessments & Special Studies Room – Colorado F <i>Nealson Watkins &amp; Dave Krask</i>	Air Toxics NATTS Room – Denver I <i>Beth Landis &amp; Eric Stevenson</i>	Data Roadmap & Automation Room – Colorado G <i>Tim Hanley &amp; Matt Harper</i>
<b>8:00am – 10:00am</b>	<b>8:00am – 10:00am</b>	<b>8:00am – 10:00am</b>
<p>Summary of the Discover-AQ Campaign and Incorporation of the Results into MDE's Conceptual Model for Ozone Transport – <i>Jennifer Hains, Maryland DOE</i></p> <p>Towards 2050: Ambient Monitoring for Supporting Clean Air and Climate Policies in California – <i>Alberto Ayala, California Air Resources Board</i></p> <p>Emissions Inventory &amp; Ambient Air Monitoring of Natural Gas Production in the Fayetteville Shale Region – <i>Toby Chu, Arkansas DEQ</i></p> <p>Value Added Monitoring in Santa Cruz County – <i>Mike Gilroy, Monterey Bay Unified Air Pollution Control District</i></p> <p>Summer Ozone Study in Clark County, NV – <i>Yousaf Hameed, Clark County Air Quality</i></p>	<p>Air Toxics Quality Assurance Update – <i>David Shelow, EPA/OAQPS</i></p> <p>NATTS Technical Assistance Document &amp; Methods Update - <i>David Shelow, EPA/OAQPS</i></p> <p>National Air Toxics Trends Stations – DRAFT Network Assessment – <i>Regi Oommen &amp; Joe Fanjoy, Eastern Research Group &amp; Beth Landis, EPA/OAQPS</i></p> <p><b>Panel Discussion on NATTS</b></p> <p><i>Beth Landis, EPA/OAQPS</i> <i>David Shelow, EPA/OAQPS</i> <i>Motria Caudill, EPA/Region 5</i> <i>Regi Oommen, Eastern Research Group</i> <i>Joe Fanjoy, Eastern Research Group</i></p>	<p><b>8:00am From Monitoring Regulations to National Databases</b> In the first part of this session we will review the definitions and metadata fields in the monitoring regulations and attempt to do a crosswalk of how that information is stored in AQS. This session will include a panel:  <i>Joe Delwiche, EPA Region 8</i> <i>Chris Chapman, EPA OAQPS - AQS</i> <i>Matt Harper, Puget Sound Clean Air Agency</i></p> <p><b>9:00am Automation in Ambient Air Monitoring Networks</b></p> <p>New AirNow Data Transfer Format: AQCSV – <i>Alan Chan, Sonoma Technologies</i></p> <p>Aethalometer Datamasher Update – <i>George Allen, NESCAUM</i></p>
<b>10:00am – 10:30am BREAK (Refreshments in Exhibit Areas)</b>		
Monitoring Regulation Changes Room – Colorado F <i>Lewis Weinstock, Michael Papp, Richard Payton &amp; Bob Judge</i>	Air Toxics Monitoring Room – Denver I <i>Dave Shelow &amp; George Allen</i>	Tribal Monitoring Room – Colorado G <i>Christopher Lee &amp; Melinda Ronca-Battista</i>
<b>10:30am – 12:00pm</b>	<b>10:30am – 12:00pm</b>	<b>10:30am – 12:00pm</b>
<p><i>This session will be conducted as a brainstorming session intended to identify issues and potential improvements to the current monitoring regulations.</i></p>	<p>Semi-continuous metals monitoring in Ohio industrial communities – <i>Motria Caudill, EPA Region 5</i></p> <p>Odors Associated with Deepwater Horizon Gulf Oil Spill – <i>Doug Jager, EPA/Region 4</i></p> <p>Method Development Studies for Hexavalent Chromium in Ambient Air Samples - <i>Victoria Genter, ERG</i></p> <p>Citizen Science – <i>Dirk Felton, New York State Department of Environmental Conservation &amp; Mazeeda Khan, EPA/Region 2</i></p>	<p><i>Interactive Discussion of Tribal Monitoring Issues</i></p>

# National Air Quality Conference – Ambient Monitoring 2012

WEDNESDAY, MAY 16, 2012 – TECHNICAL SESSIONS (continued)

**12:00pm – 1:00pm LUNCH – on your own**

<p><b>New &amp; Emerging Monitoring Technologies</b>  <b>Room – Colorado F</b>  <i>Joann Rice &amp; Stephen Hall</i></p>	<p><b>Studies in Air Toxics</b>  <b>Room – Denver I</b>  <i>Barbara Driscoll &amp; Donnette Sturdivant</i></p>	<p><b>Quality Assurance</b>  <b>Room – Colorado G</b>  <i>Dennis Crumpler, Mark Shanis &amp; Yousaf Hameed</i></p>
<p><b>1:00pm – 3:00pm</b></p> <p>Geospatial Monitoring of H<sub>2</sub>S and CH<sub>4</sub> – <i>Marta Fuoco, EPA, Region 5</i></p> <p>Long-term assessment of ultrafine particles along major roadways in Las Vegas, Nevada and Detroit, Michigan – <i>Gayle Hagler, EPA/ORD</i></p> <p>Private Unpaved Road Emissions Inventory – A Measurement Solution to an Inventory Question – <i>Robert Baxter, T&amp;B Systems</i></p> <p>Water-based Condensation Particle Counters Comparison Near a Major Freeway w/Significant Heavy Duty Diesel Traffic – <i>Andrea Polidori, South Coast AQMD</i></p> <p>Evaluation of the Magee/TAPI Model 33/633 Next-generation Aethalometer – <i>George Allen, NESCAUM</i></p>	<p><b>1:00pm – 3:00pm</b></p> <p>Air Toxics Tools – <i>Barbara Driscoll, EPA/OAQPS</i></p> <p>Ambient Monitoring Mobile Stations – <i>Andrea Polidori, South Coast AQMD</i></p> <p>Air Monitoring Study at Santa Monica Airport – <i>Andrea Polidori, South Coast AQMD</i></p> <p>What is actually emitted from Area Sources: Results of a Special Study of Metals Recyclers – <i>Loren Raun, Houston Dept of Health &amp; Human Services</i></p> <p>Long term trends in ambient 1,3 butadiene in Houston, TX – <i>Alea Bunch, URS</i></p> <p>Understanding Air Toxics and Carbonyl Pollutant Sources in Boulder County, Colorado – <i>Pam Milmoie, Boulder County Public Health</i></p>	<p><b>1:00pm – 3:00pm</b></p> <p>Technical Systems Audits - A Partnership Approach – <i>Patrick Rainey, California Air Resources Board</i></p> <p>Evaluating Siting of Air Monitoring Stations – <i>Mathew Plate, EPA Region 9</i></p> <p>2012 Report on the Pb Performance Evaluation Program – <i>Dennis Crumpler, EPA/OAQPS</i></p> <p>A Case Study on Calculating Precision – <i>Jaime Hauser, Eastern Research Group</i></p> <p>12 Year Data Quality Assessment of the PM<sub>2.5</sub> Monitoring Network – <i>Shelly Eberly, STI Subcontractor</i></p>

**3:00pm – 3:30pm BREAK (Refreshments in Exhibit Areas)**

<p><b>Criteria Pollutant Methods Issues &amp; Updates</b>  <b>Room – Colorado F</b>  <i>Joann Rice &amp; Mazeeda Khan</i></p>	<p><b>PAMS Data Workshop</b>  <b>Room – Denver I</b>  <i>Kevin Cavender &amp; Andy Johnson</i></p>	<p><b>Quality Assurance (Cont)</b>  <b>Room – Colorado G</b></p>
<p><b>3:30pm – 5:30pm</b></p> <p>Update on Federal Reference Method Research Activities – <i>Russell Long, EPA/ORD</i></p> <p>Characterization and Development of Methods for Ambient NO<sub>2</sub> – <i>Melinda Beaver, EPA/ORD</i></p> <p>Continuous PM Coarse Monitoring in Texas – <i>Bryan Lambeth, Texas Commission on Environmental Quality</i></p>	<p><b>3:30pm – 5:30pm</b></p> <p>Update of Long-term Trends Analysis of Ambient 8-hour Ozone and Precursor Monitoring Data in the South Central U.S – <i>Mark Sather, EPA Region 6</i></p> <p>Effectiveness of PAMS Network Based on 14 years of PAMS Data in San Joaquin Valley – <i>Yousheng Zeng, Providence Engineering</i></p> <p>Uses of Data from PAMS Measurements in the South Coast Basin – <i>Jason Low, South Coast AQMD</i></p>	<p><b>3:30pm – 5:30pm</b></p> <p>Simplified QA Transaction for the Reporting of QA Data to AQS – <i>Chris Chapman, EPA/OAQPS</i></p> <p>NCORE: One Year Later – <i>Chris Harrison, Southwest Ohio Air Quality Agency</i></p> <p>Evaluating Data Quality and Performance Characteristics of An Ultrasonic Anemometer vs Propeller Anemometers in Subarctic Western Alaska – <i>Cyrena-Marie Druse, McVehil-Monnett Associates</i></p>

# National Air Quality Conference – Ambient Monitoring 2012

**WEDNESDAY, MAY 16, 2012 (Continued)**

Criteria Methods Issues & Updates (Cont) Room – Colorado F <i>Joann Rice &amp; Mazeeda Khan</i>	PAMS Data Workshop (Cont) Room – Denver I <i>Kevin Cavender &amp; Andy Johnson</i>	Quality Assurance (Cont) Room – Colorado G
<b>3:30pm – 5:30pm</b>	<b>3:30pm – 5:30pm</b>	<b>3:30pm – 5:30pm</b>
<p>PM<sub>2.5</sub> Instrument Comparison: FRM vs TEOM, BAM &amp; GRIMM – <i>Cary Gentry, Forsyth County, NC</i></p> <p>ICP-MS Method for Pb and Other Metals in TSP/PM<sub>10</sub> – <i>Randy Mercurio, Eastern Research Group</i></p>	<p>Apparent Influence of Wildfires on Ozone Levels in Houston, Texas – <i>Albert Hendler, URS Corporation</i></p> <p>Using PAMS Data to Assess Potential Control Strategies to Reduce Ozone – <i>Hilary Hafner, Sonoma Technology, Inc</i></p> <p>Developing Together: A Local PAMS GC Analysis Method and U.S. EPA Regional Performance Evaluation Program – <i>Jason Low, South Coast AQMD</i></p>	<p>How Low Can You Go - Low Level Ozone Calibration – <i>Donovan Rafferty, Washington Dept of Ecology</i></p> <p>Issues and Options for Auditing NO<sub>y</sub> and CO at NCOE Sites – <i>Mark Shanis, EPA/OAQPS</i></p>

## THURSDAY, MAY 17, 2012

**7:00am – 8:00am**

Registration and Refreshments

### PLENARY SESSION – Colorado Ballroom F

<b>8:00am – 9:00am</b>	<p><b>Technical Program Updates</b></p> <ul style="list-style-type: none"> <li>• PM<sub>2.5</sub> FEM Overview, <i>Tim Hanley, EPA Office of Air Quality Planning &amp; Standards</i></li> <li>• AirNow Tech 2.0 Demonstration, <i>Lewis Weinstock, EPA Office of Air Quality Planning &amp; Standards &amp; Steve Ludewig, Sonoma Technology, Inc.</i></li> <li>• NATTS Network Overview, <i>Beth Landis, EPA Office of Air Quality Planning &amp; Standards</i></li> </ul>
<b>9:00am – 10:00am</b>	<p><b>PAMS Re-engineering Overview and Panel Discussion</b> <i>Kevin Cavender, EPA Office of Air Quality Planning and Standards</i> <i>Donna Kensi, Lake Michigan Air Directors Consortium</i> <i>Jason Low, South Coast Air Quality Management District</i> <i>Mark Sather, EPA Region 6</i> <i>David Krask, Maryland Department of the Environment</i></p>
<b>10:00am – 10:30am</b>	<b>BREAK (Refreshments in Exhibit areas )</b>
<b>10:30am – 11:00am</b>	<p><b>Sensor Applications/New Technologies</b> <i>Richard Wayland, EPA Office of Air Quality Planning &amp; Standards</i> <i>Tim Dye, Sonoma Technology, Inc.</i></p>
<b>11:00am – 12:00pm</b>	<p><b>Questions &amp; Answers with Monitoring Managers</b> <i>Richard Wayland, EPA Office of Air Quality Planning &amp; Standards</i> <i>Lewis Weinstock, EPA Office of Air Quality Planning &amp; Standards</i> <i>Meredith Kurpius, EPA Region 9</i> <i>Richard Payton, EPA Region 8</i> <i>Dick Valentinetti, Vermont Air Pollution Control Division</i> <i>Gordon Pierce, Colorado Department of Public Health &amp; Environment</i> <i>Eric Stevenson, Bay Area Air Quality Management District</i></p>
<b>Thanks for Coming! See you in two years.</b>	



# National Air Quality Conference - Ambient Monitoring 2012

## List of Poster Presentations

#	Poster Title	Presenter	Organization
1	15-year Distribution of Suspended Particulate Matters (PM10 and PM2.5) in Taiwan	Ying-Chu Chin	Taiwan EPA
2	AIRNOW-GO3 Pilot Project: Examining the Benefits of Ozone Monitoring by Schools in Colorado	Tim Dye	Sonoma Technology, Inc
3	An Alternative Approach to Ambient NO2 Monitoring	Patrick King	Teledyne API
4	An SO2 Warning System for Protection of Visitors from Volcanic Emissions	John Ray	National Park Service
5	Analysis of TO-15/TO-17 air toxics in urban air using TD-GC/ TOF MS and automated compound identification software	Nicola Watson	Markes International
6	Atmospheric Mercury Network (AMNet): Operation and Data	Mark Olson	NADP, University of Illinois
7	Beware of Floating Ground	Joel Maddy	West Virginia DEP
8	Blank Filter Results in the United States Environmental Protection Agency's PM2.5 Chemical Speciation Network (CSN) for Calendar Year 2011	James O'Rourke	RTI
9	Boundary Layer Observations in the LA Basin	David Patton	Radiometrics Corp
10	Concerns regarding 24-hour sampling for formaldehyde, acetaldehyde, and acrolein using 2,4-dinitrophenylhydrazine (DNPH) coated solid sorbents	Jason Herrington	Restek
11	DeTect Boundary Layer Wind Profilers	Scott McLaughlin	DeTect, Inc
12	Development of a low cost, high density ozone monitoring network	Mark Bart	Aeroqual Limited
13	Effectiveness of Residential Wood Burning Bans at Protecting Public Health	Clifton MacDonald	Sonoma Technology, Inc
14	Environmental Air Pollution Monitoring and Measurement using Wireless Sensor Networks	Maximilian Ani	China
15	Evaluation of Teledyne API Model 602 Beta <sup>PLUS</sup> and PM <sub>10</sub> & PM <sub>2.5</sub> FRM Measurements in Logan, UT and East St. Louis, IL During	Stephen Toner	Teledyne API
16	Evaluation of Thermo pDR-1500 Personal Nephelometer as a highly time-resolved PM2.45 surrogate measurement	George Allen	NESCAUM
17	Flozone: The Study of the Movement of Ozone from the Front Range to the Continental Divide	Melinda Merrill	Estes Park High School - Go3 Project
18	Digital Opacity Compliance System Second Generation, DOCS II	Shawn Dolan	Virtual Technology
19	High precision measurement of ambient CO, N2O and CH4 based on Mid-IR Difference Frequency Lasers	Jacob Thekkethala	Thermo Fisher Scientific

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# National Air Quality Conference - Ambient Monitoring 2012

## List of Poster Presentations

#	Poster Title	Presenter	Organization
20	Long Term Continuous Monitoring of BTEX using INFICON CMS5000	Steven Rush	INFICON Inc
21	Measuring Air Quality Over Maryland	Michael Woodman	Maryland Dept. of the Environment
22	Monitoring ozone in remote areas of the Southern Rocky Mountains	John Korfmacher	US Forest Service
23	NESCAUM Residential/Mobile Woodsmoke PM Monitoring Kit	George Allen	NESCAUM
24	New Advances in Canister Analysis; the Future of Ambient Monitoring and Soil-gas Analysis on One System	Nicola Watson	Markes International
25	NO <sub>2</sub> Near-Road Pilot: Baltimore	Dave Krask	Maryland Dept. of the Environment
26	Nozone: the Dangers of Ozone in our National Parks	Melinda Merrill	Estes Park High School - Go3 Project
27	Preliminary Look at Chemical Speciation Network (CSN) Audit and Flowcheck Data	Ed Rickman	RTI
28	Small is Beautiful	Donovan Rafferty	Washington Dept. of Ecology
29	Student Involvement in the Measurement of High Winter Ozone Episodes in Sublette County, Wyoming	Deb Noble	Pinedale High School - Go3 Project
30	Survey Measurements of Ozone in Remote Locations: What Works and How Accurate are the Measurements	John Ray	National Park Service
31	Temporal and Spatial Extremes in Black Carbon within Mexico City	Darrel Baumgardner	UNAM, Centro de Ciencias de la Atmosfera
32	Texas PM <sub>2.5</sub> Chemical Speciation Results - 2005-2009	Ricky Tropp	DRI
33	The Application of Genetic Algorithms to Air Quality Studies	Carlos Cardelino	Georgia Tech
34	The NADP's Mercury Deposition Network: lessons from a continental-scale monitoring network.	David Gay	NADP, University of Illinois
35	Using Boundary Layer Dynamics for Air Pollutant Concentration Prediction	Nicholas Clements	University of Colorado
36	Using Historic Data to Reassess the Acceptance Criteria on Laboratory Bias for the NATTS	Bob Lordo	Battelle
37	Winter Inversion Particulate Pollution Events in New Hampshire Evolution of Monitoring and Understanding - A multi-year Project	Kendall Perkins	New Hampshire Dept. of Environmental Services
38	Wintertime Measurements of Ambient Aerosol in Alaska: High Time Resolution Chemical Components	Rick Peltier	University of Massachusetts





# National Air Quality Conference

## Ambient Monitoring 2012

May 14-17, 2012

Denver Marriott City Center

Denver, Colorado



## Welcome

On behalf of the U.S. Environmental Protection Agency (EPA) and the National Association of Clean Air Agencies (NACAA), we welcome you to the National Air Quality Conference -Ambient Monitoring 2012. This conference is intended to help you gain the knowledge and skills to prepare for the future challenges of air monitoring. We hope that you will also use your time here to share your experiences, meet your colleagues, make new contacts, and benefit from the latest information on ambient air monitoring technologies and requirements.

## Conference News

### Speaker Presentations

Following the conclusion of the conference, the speaker and poster presentations will be posted on the AMTIC website at the following url: <http://www.epa.gov/ttn/amtic/naamc.html>.

### Conference Evaluation Forms

The conference evaluation will be conducted online. You will be receiving an email invitation containing the link to the evaluation form after the conference. We want your feedback! This will allow us to incorporate your ideas and comments to make future conferences more successful.

### Exhibit/Poster Session/Refreshment Breaks

The exhibits and posters will be located in portions of the Denver and Colorado Ballrooms as well as the lobby area and will remain on display until Thursday morning's AM break. Refreshment breaks will be set up in the exhibit areas. A gentle reminder that if your nametag is YELLOW, we ask that you refrain from taking any refreshments (coffee included) as you opted to not pay the refreshment fee and it would not be fair to those who did pay. If you are interested in paying the optional refreshment fee, please stop by the registration desk, and we'll be happy to assist. *This excludes the Monday refreshments and Tuesday evening reception which everyone is welcome to attend, as these have been graciously provided by our sponsors.*

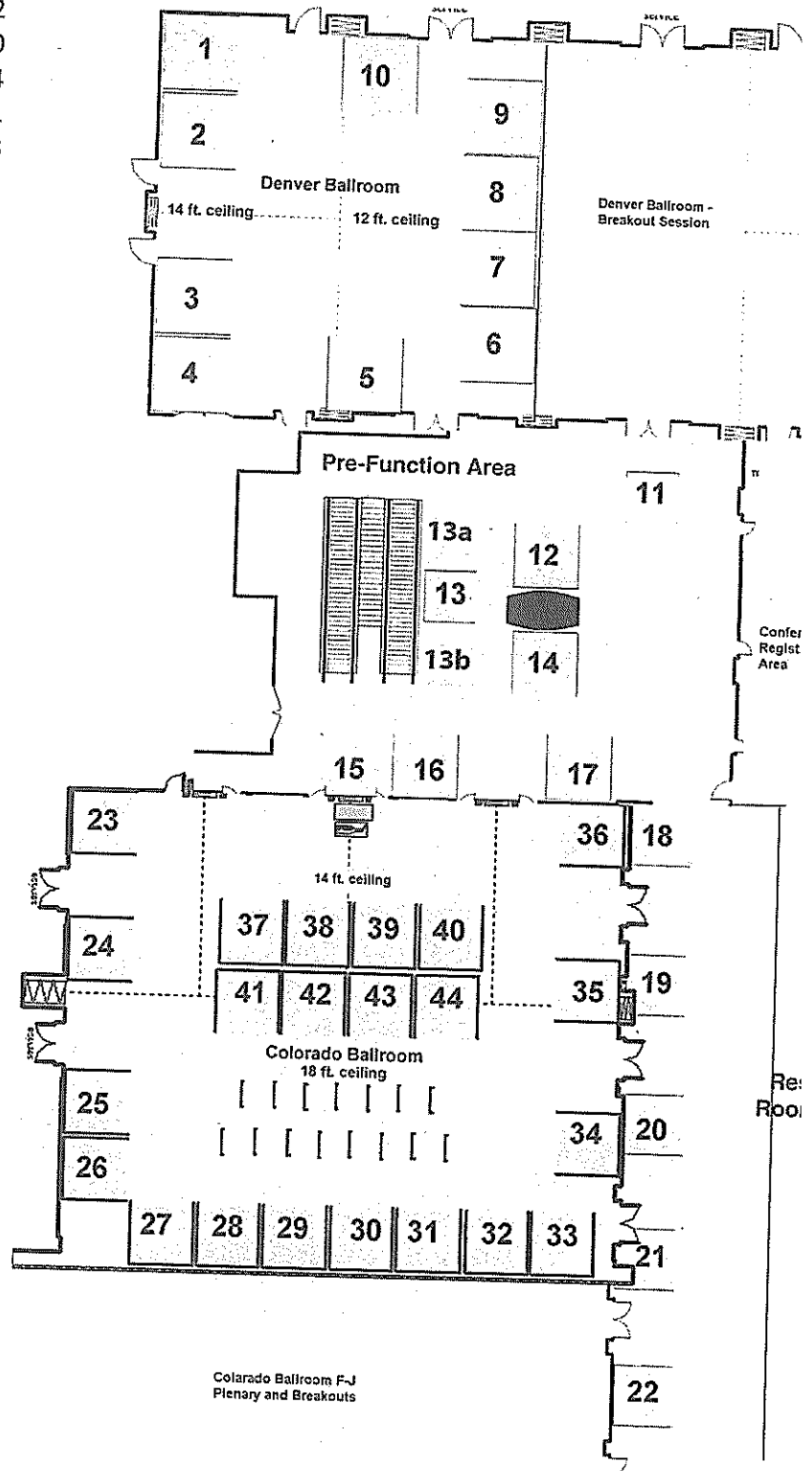
### Reception

On Tuesday evening, from 6:00pm – 8:00 pm, our sponsors are hosting a roving reception in the exhibit areas and during this time the Poster Session will be held. Poster presenters and exhibitors will be on hand to discuss their materials. We hope you will make plans to join us!



# National Air Quality Conference - Ambient Monitoring 2012 Exhibitor Floorplan

Organization Name	Booth #
2B Technologies	29
Ace Glass	12
AethLabs	30
Agilaire	34
American Ecotech	21
ARA Computing	18
Atmospheric Systems Corporation	15
Baseline- Mocon, Inc.	8
BGI	4
Campbell Scientific	3
Camsco	44
DeTect Inc.	40
DR DAS	39
Droplet Measurement Technologies	14
Entech Instruments	41
Enthalpy Analytical, Inc.	7
EnviroNics Inc.	24
Fluke Corporation	5
GO3 Foundation	28
Grimm Technologies	33
ILMO Specialty Gases	32
IPS Meteo Star	35
Merrifield & Associates, Inc.	10
Met One Instruments	17
National Atmospheric Deposition Prgm	2
New Star Environmental, Inc.	22
Ormantine USA Ltd. Inc	42
Pall Corporation	43
Providence Engineering & Env. Group	31
Radiometrics Corporation	27
Sabio Instruments	16
Shelter One, Inc.	13b
Signature Science, LLC	13
SKC-West, Inc.	11
SLR International	9
Sonoma Technology	26
Sunset Laboratory	20
Teledyne API	6
Thermo Fisher	37
Tisch Environmental	36
TSI Inc.	23
URG Corp	38
Vaisala	25
Virtual Technology, LLC	19
Wilbur Technical Services, LLC	1



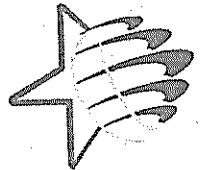
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# Special Thanks to our 2012 SPONSORS

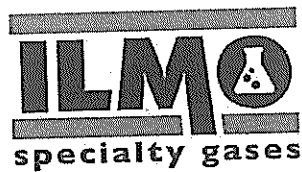
## PLATINUM



IPS MeteoStar



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ADVANCED POLLUTION INSTRUMENTATION  
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## GOLD



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## SILVER



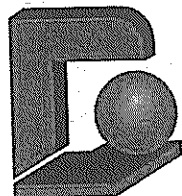
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Air Quality Research and Innovative Solutions



**CAMPBELL SCIENTIFIC**  
WHEN MEASUREMENTS MATTER



## BRONZE



GRIMM



PROVIDENCE



# National Air Quality Conference - Ambient Monitoring 2012

Denver, Colorado  
May 14-17, 2012



ATTENDEE LIST (as of May 4, 2012)

First Name	Last Name	Organization Name	Email Address	Phone
Martin	Abbott	Teledyne - API	mabbott@teledyne.com	858-642-7776
Laura	Ackerman	EPA/EIB/SESD	ackerman.laura@epa.gov	706-355-8776
Jacque	Adam	Cherokee Nation Environmental Programs	jacque-adam@cherokee.org	918-207-3876
Debra	Adams	Aglaire Corporation	dadams@aglairecorp.com	865-927-9440
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# Plenary Session - Technical Program Update

## PM<sub>2.5</sub> FEM Overview

Tim Hanley – U.S. EPA - OAQPS  
Thursday May 17<sup>th</sup>, 2012

National Air Quality Conference – Ambient Monitoring 2012

6/5/2012

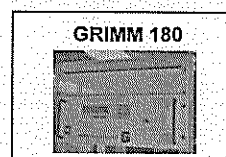
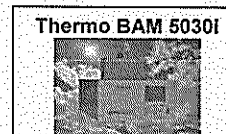
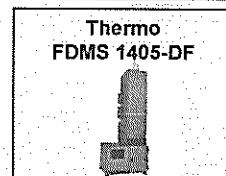
U.S. Environmental Protection Agency

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## Approved PM<sub>2.5</sub> Class III FEMs

- Met One:
  - BAM-1020 Monitor – EQPM-0308-170
- Thermo Scientific:
  - Series 8500C FDMS or 1405-F – EQPM-0609-181
  - 1405-DF FDMS – EQPM-0609-182
  - Model 5014i or FH62C14-DHS – EQPM-0609-183
  - Model 5030 SHARP – EQPM-0609-184
- GRIMM:
  - Model EDM 180 PM<sub>2.5</sub> Monitor – EQPM-0311-195

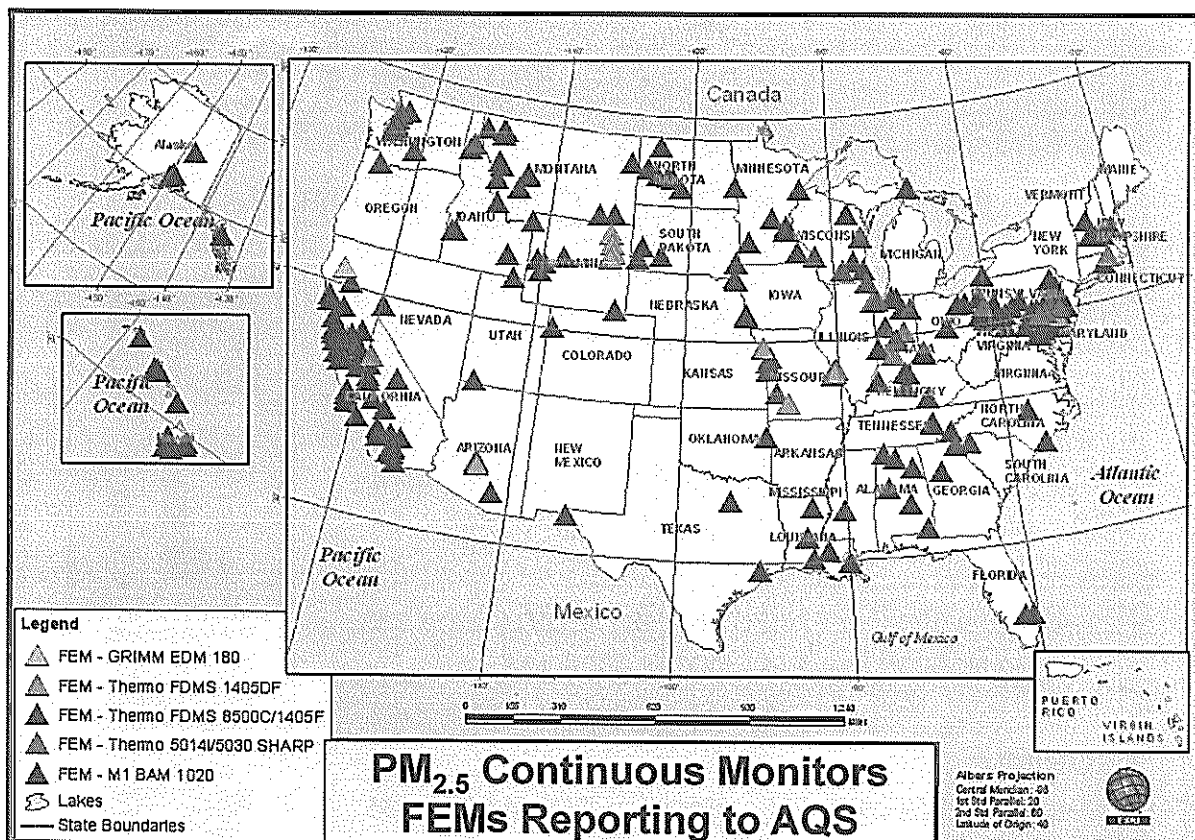


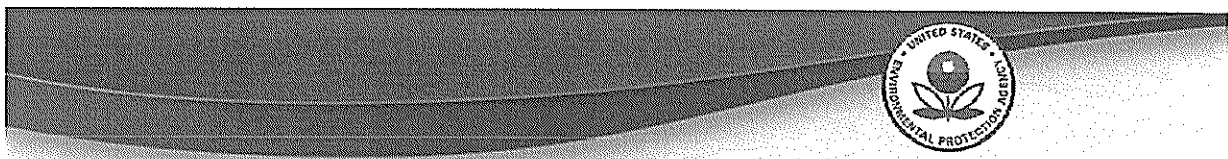
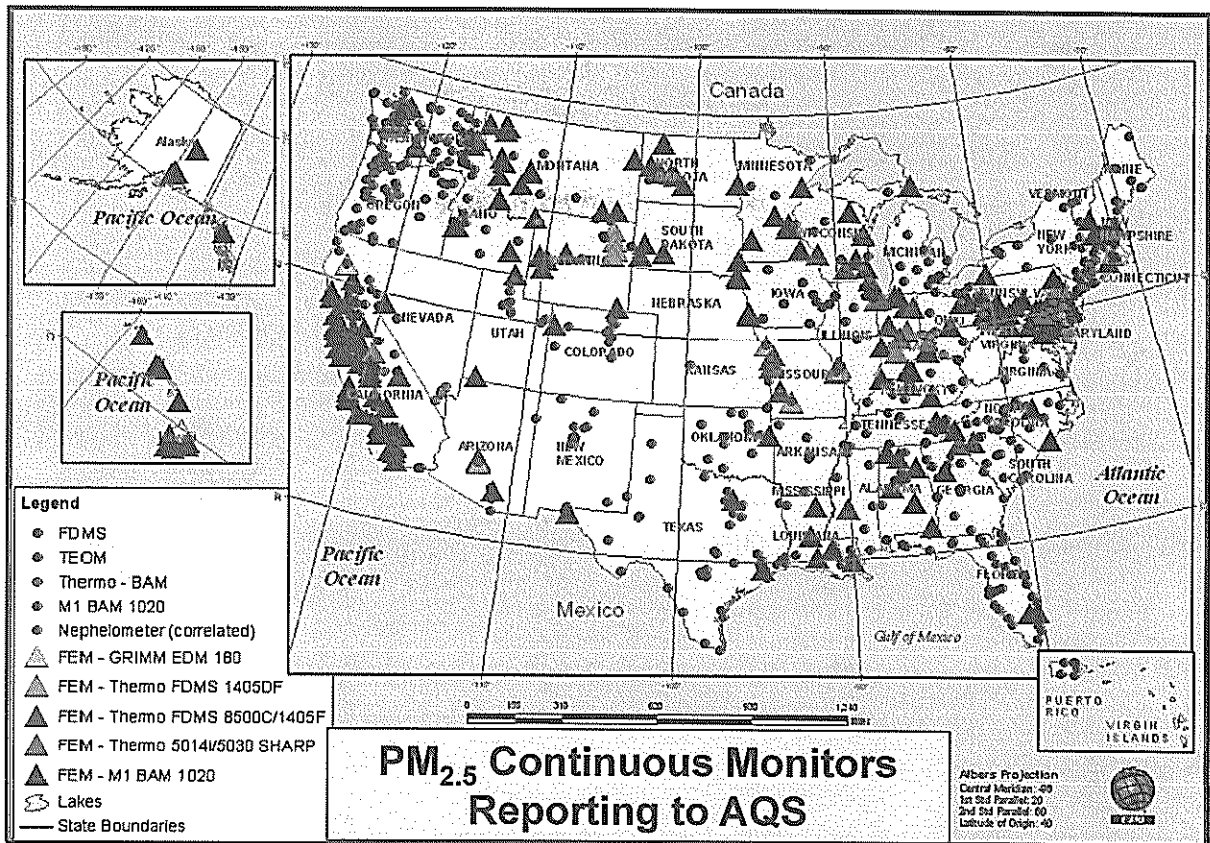


## Summary of PM<sub>2.5</sub> FEMs Reporting to AQS:

Method Description	Method Code	Monitors Reporting to AQS – May '12
Met One BAM-1020	170	209
Thermo 8500C FDMS/1405-F	181	38
Thermo 1405-DF FDMS	182	11
Thermo 5014i or FH62C14-DHS	183	1
Thermo 5030 SHARP	184	7
GRIMM EDM 180	195	2
<b>Totals</b>		<b>268</b>

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## What Material/Information is available to support operation and evaluation of PM<sub>2.5</sub> Continuous Monitors?

- Presentations from:
  - This Week
  - Previous Conferences
- Tools on the web and SOPs
- Assessments
  - Assessment (Spring 2011)
  - Comparability Assessment Tool



## Monday's Training Session – Best Practices for Operating Continuous PM<sub>2.5</sub> FEMs

Title	Presenter	Organization
Introductions, overview, web site references, assessments	Tim Hanley	U.S. EPA
Best Practice Operation Of BAM-1020	David Gobeli, Steve Wilson	Met One
Operation of Continuous PM <sub>2.5</sub> Best Practices, One Agency's Trials and Successes	Adam Blundell	Southwest Ohio Air Quality Agency
Thermo Scientific FDMS & Beta Attenuation Instrumentation – an overview and recommendations to maximize operational performance	Jeff Ambs -	Thermo Scientific
The Use of Optical Technology for Continuous Mass Monitoring of Aerosol Particles	Gil Cossett	GRIMM

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## Related Presentations this Week

Title	Presenter	Organization	Session
12 Year Data Quality Assessment of the PM <sub>2.5</sub> Monitoring Network	Shelly Ebery	STI Subcontractor	Wednesday 1pm. Quality Assurance Room - Colorado G
Continuous PM coarse Monitoring in Texas (Met One BAMs)	Bryan Lambeth	TCEQ	Wednesday 3 pm. Criteria Pollutant Methods, Issues, & Updates Room – Colorado F
PM <sub>2.5</sub> Instrument comparison: FRM vs TEOM, BAM, & GRIMM	Cary Gentry	Forsyth County, NC	Wednesday 3 pm. Criteria Pollutant Methods, Issues, & Updates Room – Colorado F

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## Select Previous Conference Sessions on PM<sub>2.5</sub> Continuous Monitoring

Conference	Session	Instruments Covered	Topics Addressed	URL
2009 National Ambient Air Monitoring Conference – Nashville TN	Continuous PM Mass Instrument Training Session	Thermo: > TEOM 1405-DF, > TEOM 1400ab with 8500C, > SHARP (5030), > FH52C14-DHS Beta Monitor  Met One: > BAM 1020  Grimm: > Model 180	> Method Descriptions > FEM Field Testing > Development Status > Tips for operation and maintenance > Operational Key Points	<a href="http://www.epa.gov/ttn/amtic/2009present.html">http://www.epa.gov/ttn/amtic/2009present.html</a>
2009 National Air Quality Conference – Portland OR  <i>Note: material in this session was presented by monitoring agency staff</i>	Continuous PM <sub>2.5</sub> Monitoring Issues	> FDMS > Met One BAM 1020 > Nephelometers	> Specific PM <sub>2.5</sub> continuous methods (tips on configuration, operation, maintenance, calibration and audit, data interpretation)	<a href="http://aimow.gov/index.cfm?action=naq_conf_2009.aq">http://aimow.gov/index.cfm?action=naq_conf_2009.aq</a>
2005 National Air Monitoring Conference – Las Vegas TN	Air Monitoring Instrumentation – Continuous PM Monitors	> TEOM FDMS > Met One BAM 1020	> History, Regs. FEM/ARM performance criteria, Field testing requirements, parameter codes  > Setup, Operation, and maintenance	<a href="http://www.epa.gov/ttn/amtic/2005present.html">http://www.epa.gov/ttn/amtic/2005present.html</a>

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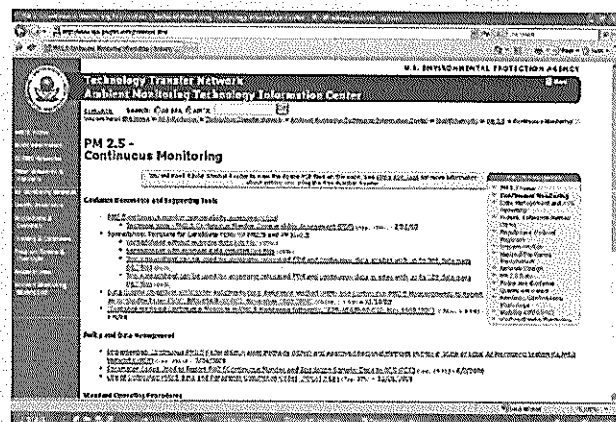
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## PM<sub>2.5</sub> Continuous Monitoring Website on AMTIC (<http://www.epa.gov/ttn/amtic/contmont.html>)

- Guidance and supporting Documents:
  - Comparability assessment tool
  - FEM/ARM spreadsheet templates
- Policy and data management memos
- SOPs
- CASAC related files
- Assessments/verifications
- Presentations



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## Assessments

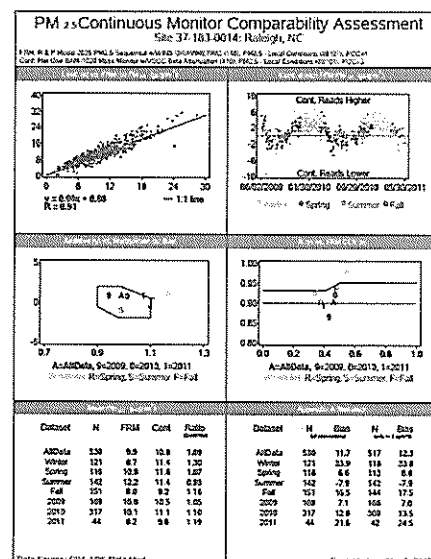
- An assessment of available PM<sub>2.5</sub> FEMs operated by routine monitoring agencies was performed in Spring of 2011
- Assessment was referenced in the PM Policy Assessment (April, 2011) and is included in the PM NAAQS docket:
  - Assessment of PM<sub>2.5</sub> FEMs Compared to Collocated FRMs; Tim Hanley and Adam Reff, OAQPS; PM NAAQS Docket, EPA - HQ - OAR - 2007 - 0492
  - Memo is available at:  
<http://www.epa.gov/ttn/naaqs/standards/pm/data/HanleyandReff040711.pdf>
- Detailed one page assessments are available at:  
<http://www.epa.gov/ttn/analysis/pm.htm>
  - Met One BAM 1020 Assessments - 61 sites
  - Thermo Scientific Ambient Particulate Monitor with Series 8500C FDMS Assessments - 17 sites
  - Thermo Scientific Model 5030 SHARP Assessments - 2 sites

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## Comparability Assessment Tool

- Available at:  
[http://www.epa.gov/airquality/airdata/ad\\_rep\\_fr\\_mvfm.html](http://www.epa.gov/airquality/airdata/ad_rep_fr_mvfm.html)
- Provides one-page assessment
- Data is from AQS Data Mart where there is a collocated PM<sub>2.5</sub> FRM and PM<sub>2.5</sub> continuous monitor.
- Includes PM<sub>2.5</sub> continuous data submitted to any the following parameter codes:
  - 88101, 88500, 88502, 88501
- Technical note explaining tool is available at:  
<http://www.epa.gov/ttn/amtic/files/ambient/pm25/comparabilityassessmenttool.pdf>







## Comparability Assessment Tool Summary

- Tool provides quick and valuable assessment
  - However, some runs may take several minutes
- The assessment assumes the FRM represents the true value, even though the FRM will have its own uncertainty
- Assessments should be used as a guide and not a bright line

*From Section 2.3.1.1 of Appendix A to Part 58:*

*Measurement Uncertainty for Automated and Manual PM<sub>2.5</sub> Methods.*

*The goal for acceptable measurement uncertainty is defined as 10 percent coefficient of variation (CV) for total precision and plus or minus 10 percent for total bias*

Bias is calculated from samples collected in PEP program.

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## AQS Parameter Codes for PM<sub>2.5</sub> Continuous Monitoring Data Reporting

Parameter Name	Parameter Code	Purpose	Data uses
PM2.5 LOCAL CONDITIONS	88101	Appropriate code for all FRM/FEM/ARMs	<ul style="list-style-type: none"> <li>&gt; AirData AQI calculations</li> <li>&gt; NAAQS (unless coded with "non-regulatory")</li> </ul>
PM2.5 TOTAL ATMOSPHERIC	88500	Valid data from methods measuring total PM <sub>2.5</sub> aerosols in the atmosphere, including those that can be volatilized from the FRM	
PM2.5 RAW DATA	88501	Valid uncorrected data that <u>does not</u> reasonably match the FRM	
ACCEPTABLE PM2.5 AQI & SPECIATION MASS	88502	Valid data that <u>does</u> reasonably match the FRM with or without correction, but not to be used in NAAQS decisions	<ul style="list-style-type: none"> <li>&gt; AirData AQI calculations</li> </ul>
PM2.5 VOLATILE CHANNEL	88503	Store important related data such as the FDMS reference channel	

Technical Note covering codes available at <http://www.epa.gov/ttn/amtic/cpreldoc.html>

88101 is only parameter code eligible for NAAQS decision-making 14



## PM<sub>2.5</sub> Continuous Monitoring Data Reporting Summary

- General
  - Report hourly data, make sure flow system is operating on local conditions, ensure data for a given hour is placed as the “Start Hour”.
- Two related policy Memo’s address data reporting to AQS:
  - Implementing Continuous PM<sub>2.5</sub> Federal Equivalent Methods (FEMs) and Approved Regional Methods (ARMs) in State or Local Air Monitoring Station (SLAMS) Networks, 7/24/2008
  - Parameter Codes Used to Report PM<sub>2.5</sub> Continuous Monitor and Speciation Sampler Data to AQS, 6/2/2006
- Monitoring Agency decision to use FEM continuous PM<sub>2.5</sub> data for comparison to the NAAQS:
  - Generally “SLAMS” and “Primary monitor” to use data, or
  - “SPM” and “Non-regulatory” to not use it; however, other FRM/FEM must be operating as primary monitor.
  - Recommend your agency state intentions in Annual Network Plan

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## Areas to Work On:

- Continue to use assessments to inform where improvements are needed:
  - PM<sub>2.5</sub> Continuous Monitor Comparability Assessment
  - PM<sub>2.5</sub> Performance evaluation data
    - WINS vs VSCC
    - PM<sub>2.5</sub> Continuous FEM vs PEP?
- Develop Audit Checklists specific to PM<sub>2.5</sub> Continuous FEMs
  - Generic
  - For specific areas of the most utilized methods
    - e.g., zero test on Met One BAM 1020
    - e.g., yearly (minimum) maintenance on FDMS dryer



## Areas to Work On (*continued*):

- Update to Draft SOPs:
  - Incorporate what we have learned
  - Provide concise directions for the most common maintenance and troubleshooting areas
- Incorporate improvements to PM<sub>2.5</sub> continuous FEMs where available?
  - Collaboratively with instrument companies
  - As ARMs?
- Anything Else?

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