### **Primary Quality Assurance Organization Training**

# Module 3: Air Monitoring Instrument Operation

July 28-29, 2015 • McClellan Wild Land Training Center

<b>MONDAY, JULY 27, 2015</b>
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2:00 – 5:00 p.m. **Exhibitor Set-Up** 

#### **TUESDAY, JULY 28, 2015**

8:00 - 8:30 a.m. **Registration and Exhibit Viewing** 

8:30 – 8:45 a.m. Welcome – Overview of Training Program

Michael Miguel

8:45 - 9:15 a.m. **Keynote Address** 

Alberto Ayala

9:15 - 10:15 a.m. Laboratory Analyses: Beyond the Masses

**Michael Werst** 

10:15 - 10:45 a.m. **Break and Exhibit Viewing** 

10:45 - 11:30 a.m. Air Monitoring and New Technology

Ken Stroud

11:30 - 11:45 a.m. **Breakout Sessions** 

Michael Miguel

11:45 - 1:00 p.m. Lunch and Exhibit Viewing

1:00 - 5:00 p.m. **Breakout Session 1** 

**SEE PAGES 2-3** 

5:00 - 5:30 p.m. **Exhibit Viewing** 

5:30 - 6:30 p.m. **Evening Reception** 

#### WEDNESDAY, JULY 29, 2015

7:30 – 8:00 a.m. Registration and Exhibit Viewing

8:00 - 12:00 p.m. **Breakout Session 2** 

**SEE PAGES 4-5** 

12:00 – 1:00 p.m. Lunch, Exhibit Viewing and Audit Van

**Tours** 

1:00 - 5:00 p.m. **Breakout Session 3** 

**SEE PAGES 6-7** 

5:00 p.m. **Training Concludes** 

## **BREAKOUT SESSION 1:** 1:00 – 5:00 p.m.

Thermo (Gaseous Analyzers)	Thermo (PM Samplers)	Teledyne/API (Gaseous Analyzers)	Teledyne/API (PM Samplers)	Met One (PM Samplers/Met)	American Ecotech	Alicat/ 2B Technologies, Inc.
Thirty Mile A	Thirty Mile B	Banning	Inaja	Guide	Loop A	Loop B
1:00 - 2:00 p.m.  Theory and Principles of Operation (NOx-42i and 03-49i)  Overview of Instrument Manuals  Brief Overview of SO2-43i and CO-48i  What's New!  Question/Answer Session  2:00 - 3:15 p.m. (NOx-42i - Hands-on)  General Operation  Maintenance  Troubleshooting  3:15 - 3:45 p.m. BREAK  3:45 - 5:00 p.m. (03-49i - Hands-on)  General Operation  Maintenance  Troubleshooting	1:00 - 2:00 p.m.  Theory and Principles of Operation (2000i and 2025i)  Overview of Instrument Manuals  Brief Overview of 5014i Beta Continuous Monitor and TEOM Ambient Particle Monitor  What's New!  Question/Answer Session  2:00 - 2:30 p.m. (2000i)  General Operation  2:30 - 3:15 p.m. (2025i)  General Operation  3:15 - 3:45 p.m. BREAK  3:45 - 5:00 p.m. (2000i and 2025i - Hands-on)  Maintenance  Troubleshooting	1:00 - 2:00 p.m.  Theory and Principles of Operation  Overview of Instrument Manuals  What's New!  Question/Answer Session  2:00 - 3:15 p.m. (03 - Hands-on)  General Operation  Maintenance  Troubleshooting  3:15 - 3:45 p.m. BREAK  3:45 - 5:00 p.m. (NOx - Hands-on)  General Operation  Maintenance  Troubleshooting	1:00 - 2:00 p.m.  Theory and Principles of Operation  Overview of Instrument Manuals  What's New!  Question/Answer Session  2:00 - 3:15 p.m. (602 - Hands-on)  General Operation  Maintenance  Troubleshooting  3:15 - 3:45 p.m. BREAK  3:45 - 5:00 p.m. (633BC - Hands-on)  General Operation  Maintenance  Troubleshooting	1:00 - 2:00 p.m.  Theory and Principles of Operation (BAM 1020/SASS and MET)  Overview of Instrument Manuals  Brief Overview (BAM 1020/SASS and MET)  What's New!  Question/Answer Session  2:00 - 3:15 p.m. (BAM 1020/SASS - Hands-on)  General Operation  Maintenance  Troubleshooting  3:15 - 3:45 p.m. BREAK  3:45 - 5:00 p.m. (Met: Sonic and Anemometer - Hands-on)  General Operation  Maintenance  Troubleshooting	Gaseous Anaylzers  Continuous VOC Turnkey PAMS  O3, NOx, H2S/SO2, CO, NH3  Dilution Calibrator  Particulate Monitoring  Nephelometer  Smoke Monitoring  Climate Change Monitoring  Hi-Vol and MicroVol air samplers  Data Systems Management  Improvements with Remote Maintenance  Mini-Logger & Digital Logger  Data Validation Software  Gaseous Anaylzers  Lower Cost Monitoring Shelters  Assistance with site setup & operations	ALICAT  We make a multivariate calibration device for flow, temperature, and pressure, which is used to calibrate gas analyzer calibrators and PM samplers. Our device features instantaneous flow readings as well as averaged flow readings depending on what you need for your data. Come see us in Loop B to get a look at our product and learn more about Alicat!  2B TECHNOLOGIES, INC.  Model 211 Interference free Ozone monitor  Model 202/205 Portable FEM Ozone monitors  Model 306 Portable Ozone Calibration Source™ 0 − 1000 ppbv  POM - The smallest UV based Ozone monitor in the market  Model 405nm direct absorbance NO2/NO/NOx monitor™

# BREAKOUT SESSION 1: 1:00 – 5:00 p.m. (continued)

Calibration Devices/CPCs	Particulates/Data Loggers	Special Projects	General
Hamm A	Hamm B	Mann Gulch	Cerro Grande
1:00 – 2:05 p.m. BGI Mesa Labs (Calibration Devices) • General Operation • Instrument Overview • Troubleshooting	1:00 – 1:45 p.m. Tisch  • Theory and Principles of Sampler Operation  • Overview of Instrument Manuals  • What's New!  • Question/Answer Session	1:00 – 1:45 p.m. South Coast AQMD  • Air Quality Sensor Performance Evaluation Center  – Andrea Polidori	2:00 – 2:45 p.m. ARB (Filter Handling Presentation/ Demonstration)  – Alicia Adams/Nial Maloney  • General Overview
<ul><li>What's New!</li><li>Question/Answer Session</li></ul>	1:45 – 2:30 p.m. Tisch (Hi-Vol – Hands-on)	1:45 – 2:30 p.m. Great Basin APCD  • Lakebed Update  – Chris Lanane	<ul><li>Inspection Process/Demo</li><li>Question/Answer Session</li></ul>
2:05 – 3:15 p.m. Sabio (Calibration Devices)  • General Operation  • Instrument Overview	<ul><li> General Operation</li><li> Maintenance</li><li> Troubleshooting</li></ul>	2:30 – 3:15 p.m. ARB  • Emergency Response Monitoring  – Greg Vlasek	2:45 – 3:15 p.m. ARB (Toxics/GHG Analyses) – Kathy Gill • General Overview
<ul><li>Troubleshooting</li><li>What's New!</li><li>Question/Answer Session</li></ul>	2:30 – 3:15 p.m. Tisch (TE Wilbur – Hands-on) • General Operation	3:15 - 3:45 p.m. BREAK	<ul><li>Analytical Process</li><li>Question/Answer session</li></ul>
3:15 - 3:45 p.m. BREAK  3:45 - 5:00 p.m. TSI (Particle Counter)  • Theory and Principles of Operation  • Overview of Instrument Manual  • General Operation  • Maintenance/Troubleshooting  • Question/Answer Session	<ul><li>Maintenance</li><li>Troubleshooting</li></ul>	3:45 – 4:15 p.m. ARB  • Performance Evaluation of a Condensation Particle Counter	3:45 - 3:45 p.m. BREAK  3:45 - 5:00 p.m. STI  - Natalie LaGuardia  • Electronic Site Information Management
	3:15 - 3:45 p.m. BREAK	– Ahmed Mehadi	
	3:45 - 5:00 p.m. Agilaire (Data Logger/Management) • General Operation • Instrument Overview • Troubleshooting • What's New!	PARKING LOT  3:45 – 4:15 p.m. ARB (Through-The-Probe Audits)  • General Overview  • Audit Demonstration  • Question/Answer Session	System     Data Management Demo     Question/Answer Session
	Question/Answer Session	4:15 – 4:45 ARB (Through-The-Probe Audits)  • General Overview  • Audit Demonstration  • Question/Answer Session	
		3:45 – 5:00 Air Monitoring Trailer Demo (Thermo )  • General Overview  • Question/Answer Session	

## **BREAKOUT SESSION 2:** 8:00 – 12:00 p.m.

Thermo (Gaseous Analyzers)	Thermo (PM Samplers)	Teledyne/API (Gaseous Analyzers)	Teledyne/API (PM Samplers)	Met One (PM Samplers/Met)	American Ecotech	Alicat/ 2B Technologies, Inc.
Thirty Mile A	Thirty Mile B	Banning	Inaja	Guide	Loop A	Loop B
8:00 - 9:00 a.m.  Theory and Principles of Operation (NOx-42i and 03-49i)  Overview of Instrument Manuals  Brief Overview of S02-43i and C0-48i  What's New!  Question/Answer Session  9:00 - 10:15 a.m. (NOx-42i - Hands-on)  General Operation  Maintenance  Troubleshooting  10:15 - 10:45 a.m. BREAK  10:45 - 12:00 p.m. (03-49i - Hands-on)  General Operation  Maintenance  Troubleshooting	8:00 - 9:00 a.m.  Theory and Principles of Operation (2000i and 2025i)  Overview of Instrument Manuals  Brief Overview of 5014i Beta Continuous Monitor and TEOM Ambient Particle Monitor  What's New!  Question/Answer Session  9:00 - 9:30 a.m. (2000i)  General Operation  9:30 - 10:15 a.m. (2025i)  General Operation  10:15 - 10:45 BREAK  10:45 - 12:00 p.m. (2000i and 2025i - Hands-on)  Maintenance  Troubleshooting	8:00 - 9:00 a.m.  Theory and Principles of Operation  Overview of Instrument Manuals  What's New!  Question/Answer Session  9:00 - 10:15 a.m. (03 - Hands-on)  General Operation  Maintenance  Troubleshooting  10:15 - 10:45 a.m. BREAK  10:45 - 12:00 p.m. (NOx - Hands-on)  General Operation  Maintenance  Troubleshooting	8:00 - 9:00 a.m.  Theory and Principles of Operation  Overview of Instrument Manuals  What's New!  Question/Answer Session  9:00 - 10:15 a.m. (602 - Hands-on)  General Operation  Maintenance  Troubleshooting  10:15 - 10:45 a.m. BREAK  10:45 - 12:00 p.m. (633BC - Hands-on)  General Operation  Maintenance  Troubleshooting	8:00 - 9:00 a.m.  Theory and Principles of Operation (BAM 1020/SASS and MET)  Overview of Instrument Manuals Brief Overview (BAM 1020/SASS and MET)  What's New! Question/Answer Session  9:00 - 10:15 a.m. (BAM 1020/SASS - Hands-on) General Operation Maintenance Troubleshooting  10:15 - 10:45 a.m. BREAK  10:45 - 12:00 p.m. (Met: Sonic and Anemometer - Hands-on) General Operation Maintenance Troubleshooting  10:15 - 10:45 a.m. BREAK	Gaseous Anaylzers  Continuous VOC Turnkey PAMS  O3, NOx, H2S/SO2, CO, NH3  Dilution Calibrator  Particulate Monitoring  Nephelometer  Smoke Monitoring  Climate Change Monitoring  Hi-Vol and MicroVol air samplers  Data Systems Management  Improvements with Remote Maintenance  Mini-Logger & Digital Logger  Data Validation Software  Gaseous Anaylzers  Lower Cost Monitoring Shelters  Assistance with site setup & operations	ALICAT  We make a multivariate calibration device for flow, temperature, and pressure, which is used to calibrate gas analyzer calibrators and PM samplers. Our device features instantaneous flow readings as well as averaged flow readings depending on what you need for your data. Come see us in Loop B to get a look at our product and learn more about Alicat!  2B TECHNOLOGIES, INC.  Model 211 Interference free Ozone monitor  Model 202/205 Portable FEM Ozone monitors  Model 306 Portable Ozone Calibration Source™ 0 − 1000 ppbv  POM - The smallest UV based Ozone monitor in the market  Model 405nm direct absorbance NO2/NO/NOx monitor™

# **BREAKOUT SESSION 2:** 8:00 – 12:00 p.m.

Calibration Devices/CPCs	Calibration Devices/CPCs Particulates/Data Loggers  Hamm A Hamm B		General  Cerro Grande	
Ramm A  8:00 – 9:05 a.m. BGI Mesa Labs (Calibration Devices)  • General Operation  • Instrument Overview  • Troubleshooting  • What's New!	Ramm B  8:00 – 8:45 a.m. Tisch  • Theory and Principles of Sampler Operation  • Overview of Instrument Manuals  • What's New!  • Question/Answer Session	Mann Gulch  8:00 - 9:05 a.m.  • AQMIS/ADAM Demo  — Mike Redgrave  9:05 - 10:15 a.m.  • AirNow Tech Demo — STI	8:00 – 8:30 a.m. Picarro (GHG Monitoring)  • Theory and Principles of Operation  • Overview of Instrument Manual  • Question/Answer Session	
Question/Answer Session	8:45 – 9:30 a.m. Tisch (Hi-Vol – Hands-on) • General Operation • Maintenance	- Natalie LaGuardia	8:30 – 9:45 a.m. Picarro (GHG Monitoring)  • General Operation  • Maintenance  • Troubleshooting  9:45 – 10:15 a.m. LGR (GHG Monitoring)  • Theory and Principles of Operation  • Overview of Instrument Manual	
9:05 – 10:15 a.m. Sabio (Calibration Devices)		10:15 - 10:45 a.m. BREAK		
<ul> <li>General Operation</li> <li>Instrument Overview</li> <li>Troubleshooting</li> <li>What's New!</li> <li>Question/Answer Session</li> </ul>	• Troubleshooting  9:30 – 10:15 a.m. Tisch (TE Wilbur – Hands-on) • General Operation • Maintenance	10:45 - 12:00 • AQS Demo – U.S. EPA – Fletcher Clover		
10:15 - 10:45 a.m. BREAK	Troubleshooting		Question/Answer Session	
10:45 - 12:00 p.m. TSI (Particle Counter)	10:15 - 10:45 a.m. BREAK		10:15 - 10:45 a.m. BREAK	
<ul> <li>Theory and Principles of Operation</li> <li>Overview of Instrument Manual</li> <li>General Operation</li> <li>Maintenance/Troubleshooting</li> <li>Question/Answer Session</li> </ul>	10:45 - 12:00 p.m. Agilaire (Data Logger/Management)  General Operation Instrument Overview Troubleshooting What's New! Question/Answer Session		10:45 - 12:00 p.m. LGR (GHG Monitoring) • General Operation • Maintenance • Troubleshooting	

### WEDNESDAY, JULY 29, 2015

## **BREAKOUT SESSION 3:** 1:00 – 5:00 p.m.

Thermo (Gaseous Analyzers)	Thermo (PM Samplers)	Teledyne/API (Gaseous Analyzers)	Teledyne/API (PM Samplers)	Met One (PM Samplers/Met)	American Ecotech	Alicat/ 2B Technologies, Inc.
Thirty Mile A	Thirty Mile B	Banning	Inaja	Guide	Loop A	Loop B
1:00 - 2:00 p.m.  Theory and Principles of Operation (NOx-42i and 03-49i)  Overview of Instrument Manuals  Brief Overview of S02-43i and C0-48i  What's New!  Question/Answer Session  2:00 - 3:15 p.m. (N0x-42i - Hands-on)  General Operation  Maintenance  Troubleshooting  3:15 - 3:45 p.m. BREAK  3:45 - 5:00 p.m. (03-49i - Hands-on)  General Operation  Maintenance  Troubleshooting	1:00 - 2:00 p.m.  Theory and Principles of Operation (2000i and 2025i)  Overview of Instrument Manuals  Brief Overview of 5014i Beta Continuous Monitor and TEOM Ambient Particle Monitor  What's New!  Question/Answer Session  2:00 - 2:30 p.m. (2000i)  General Operation  2:30 - 3:15 p.m. (2025i)  General Operation  3:15 - 3:45 p.m.  BREAK  3:45 - 5:00 (2000i and 2025i - Hands-on)  Maintenance  Troubleshooting	1:00 - 2:00 p.m.  Theory and Principles of Operation  Overview of Instrument Manuals  What's New!  Question/Answer Session  2:00 - 3:15 p.m. (03 - Hands-on)  General Operation  Maintenance  Troubleshooting  3:15 - 3:45 p.m.  BREAK  3:45 - 5:00 (NOx - Hands-on)  General Operation  Maintenance  Troubleshooting	1:00 - 2:00 p.m.  Theory and Principles of Operation  Overview of Instrument Manuals  What's New!  Question/Answer Session  2:00 - 3:15 p.m. (602 - Hands-on)  General Operation  Maintenance  Troubleshooting  3:15 - 3:45 p.m. BREAK  3:45 - 5:00 (633BC - Hands-on)  General Operation  Maintenance  Troubleshooting	1:00 - 2:00 p.m.  Theory and Principles of Operation (BAM 1020/SASS and MET)  Overview of Instrument Manuals  Brief Overview (BAM 1020/SASS and MET)  What's New!  Question/Answer Session  2:00 - 3:15 p.m. (BAM 1020/SASS – Hands-on)  General Operation  Maintenance  Troubleshooting  3:15 - 3:45 p.m.  BREAK  3:45 - 5:00 p.m. (Met: Sonic and Anemometer – Hands-on)  General Operation  Maintenance  Troubleshooting	Gaseous Anaylzers  Continuous VOC Turnkey PAMS  O3, NOx, H2S/SO2, CO, NH3  Dilution Calibrator  Particulate Monitoring  Nephelometer  Smoke Monitoring  Climate Change Monitoring  Hi-Vol and MicroVol air samplers  Data Systems Management  Improvements with Remote Maintenance  Mini-Logger & Digital Logger  Data Validation Software  Gaseous Anaylzers  Lower Cost Monitoring Shelters  Assistance with site setup & operations	ALICAT  We make a multivariate calibration device for flow, temperature, and pressure, which is used to calibrate gas analyzer calibrators and PM samplers. Our device features instantaneous flow readings as well as averaged flow readings depending on what you need for your data. Come see us in Loop B to get a look at our product and learn more about Alicat!  2B TECHNOLOGIES, INC.  Model 211 Interference free Ozone monitor  Model 202/205 Portable FEM Ozone monitors  Model 306 Portable Ozone Calibration Source™ 0 − 1000 ppbv  POM - The smallest UV based Ozone monitor in the market  Model 405nm direct absorbance NO2/NO/NOx monitor™

# BREAKOUT SESSION 3: 1:00 – 5:00 p.m. (continued)

Calibration Devices/CPCs	Particulates/Data Loggers	Special Projects	General	
Hamm A	Hamm B	Mann Gulch	Cerro Grande	
1:00 – 2:05 p.m. BGI Mesa Labs (Calibration Devices)  General Operation Instrument Overview	1:00 – 1:45 p.m. Tisch  • Theory and Principles of Sampler Operation  • Overview of Instrument Manuals	8:00 - 9:05 a.m. • AQMIS/ADAM Demo - Mike Redgrave	1:00 – 1:30 p.m. Picarro (GHG Monitoring)  • Theory and Principles of Operation • Overview of Instrument Manual	
<ul><li>Troubleshooting</li><li>What's New!</li><li>Question/Answer Session</li></ul>	<ul> <li>What's New!</li> <li>Question/Answer Session</li> <li>1:45 - 2:30 p.m. Tisch (Hi-Vol - Hands-on)</li> <li>General Operation</li> <li>Maintenance</li> <li>Troubleshooting</li> <li>2:30 - 3:15 p.m. Tisch (TE Wilbur - Hands-on)</li> <li>General Operation</li> <li>Maintenance</li> <li>Troubleshooting</li> <li>3:15 - 3:45 p.m. BREAK</li> <li>3:45 - 5:00 p.m. Agilaire (Data Logger/Management)</li> <li>General Operation</li> <li>Instrument Overview</li> <li>Troubleshooting</li> <li>What's New!</li> </ul>	2:05 - 3:15 p.m.  • AirNow Tech Demo - STI  – Natalie LaGuardia	• Question/Answer Session  1:30 – 2:45 p.m. Picarro	
2:05 – 3:15 p.m. Sabio (Calibration Devices)  • General Operation  • Instrument Overview  • Troubleshooting  • What's New!  • Question/Answer Session		3:15 - 3:45 p.m. BREAK	(GHG Monitoring) • General Operation • Maintenance	
		3:45 - 5:00 • AQS Demo – U.S. EPA – Fletcher Clover	• Troubleshooting  2:45 – 3:15 p.m. LGR	
		PARKING LOT	(GHG Monitoring) • Theory and Principles of Operation	
3:15 - 3:45 p.m. BREAK		3:45 – 4:15 p.m. ARB (Through-The-Probe Audits) • General Overview • Audit Demonstration	Overview of Instrument Manual     Question/Answer Session	
3:45 - 5:00 p.m. TSI (Particle Counter)  • Theory and Principles of Operation  • Overview of Instrument Manual  • General Operation  • Maintenance/Troubleshooting  • Question/Answer Session			3:15 - 3:45 p.m. BREAK	
		• Question/Answer Session	3:45 - 5:00 p.m. LGR (GHG Monitoring)	
		4:15 – 4:45 p.m. ARB (Through-The-Probe Audits)  • General Overview  • Audit Demonstration  • Question/Answer Session	<ul><li>General Operation</li><li>Maintenance</li><li>Troubleshooting</li></ul>	
	Question/Answer Session	3:45 – 5:00 p.m.  Air Monitoring Trailer Demo (Thermo)  General Overview  Question/Answer Session		