

STATE OF CALIFORNIA  
AIR RESOURCES BOARD

AIR MONITORING QUALITY ASSURANCE

VOLUME V

AUDIT PROCEDURES  
FOR  
AIR QUALITY MONITORING

APPENDIX AC

AMBIENT AIR COMPARISON CHECK PROCEDURES  
FOR  
NON-METHANE HYDROCARBON COMPOUNDS

MONITORING AND LABORATORY DIVISION

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## TABLE OF CONTENTS

### AMBIENT AIR COMPARISON CHECK PROCEDURES FOR NON-METHANE HYDROCARBON COMPOUNDS

#### APPENDIX AC

		<u>PAGES</u>	<u>REVISION</u>	<u>DATE</u>
AC.1.0	GENERAL INFORMATION	8	1	9/03/02
	AC.1.0.1 Background			
	AC.1.0.2 Notifications			
	AC.1.0.3 Cautions			
	AC.1.0.4 Cleaning and Verification			
AC.2.0	SAMPLING PROCEDURES	4	0	4/15/99
	AC.2.0.1 Apparatus			
	AC.2.0.2 Pre-Sampling Setup			
	AC.2.0.3 Leak Check			
	AC.2.0.4 Canister Pressurization			
	AC.2.0.5 Post-Sampling Procedure			
AC.3.0	POST ANALYSIS DATA COLLECTION	5	1	9/03/02

## FIGURES

### AMBIENT AIR COMPARISON CHECK PROCEDURES FOR NON-METHANE HYDROCARBON COMPOUNDS

#### APPENDIX AC

	<u>Page</u>
Figure AC.1.0.1.....XonTech 910A Sampler Front & Rear Panels.....	4
Figure AC.1.0.2.....Sampler Schematic.....	5
Figure AC.1.0.3.....Calibration Data for Modified XonTech 910A.....	6
Figure AC.1.0.4.....Protocol.....	7
Figure AC.3.0.1.....Ambient Air NMHC Laboratory Comparison Check Results.....	2
Figure AC.3.0.2.....Ambient Air NMHC Laboratory Comparison Check Graphs.....	4

**AC.1.0 GENERAL INFORMATION**

**AC.1.0. BACKGROUND**

Laboratory analyses of non-methane hydrocarbons (hydrocarbons) present in a sample of ambient air are conducted on an annual basis at participating laboratories throughout the state. Laboratory responses are then compared. The comparison is intended to support the Photochemical Assessment Monitoring Station (PAMS) program by evaluating the ability of laboratories to produce consistent hydrocarbon data from ambient air samples both in terms of the number of compounds present and their concentrations. In addition to the PAMS program, the comparison check is also applicable to the toxics program. By sending the laboratories ambient air samples obtained at the same time under the same conditions, a quantitative comparison can be made of the analytical methods used.

Stainless steel canisters are filled with ambient air using a modified XonTech 910A sampler and sent to participating laboratories for analysis. To fill multiple canisters simultaneously over a 3-hour period, to an approximate pressure of 14 psig, the 910A was outfitted with a 2000 cc/min mass flow controller (MFC) and a manifold. The manifold was constructed using stainless steel union crosses and tees and allows for up to ten, six-liter sampling canisters to be filled from the sampler's single outlet port (see Figures AC.1.0.1 and AC.1.0.2).

The sampler is calibrated for each of ten specific flow rates. Each flow rate corresponds to a specific number of sample canisters to be filled, ranging from one to ten, to a final pressure of approximately 14 psig (see Figure AC.1.0.3). It should be noted that the modified 910A's calibration is valid only for the ten specific flow rates required to pressurize from one to ten canisters; the sampler's calibration is not valid for any other flow rates.

The flow rates for pressurizing canisters using the modified XonTech 910A sampler have been determined from the following formula:

$$F = (P)(V) / (T)(60)$$

Where F = flow rate, in cc/min.

P = final absolute pressure of each of the sample canisters, in atmospheres.

**Note:** The absolute pressure equals the sum of the gauge pressure and the local atmospheric pressure:  $P_{\text{ABSOLUTE}} = P_{\text{GAUGE}} + P_{\text{ATMOSPHERE}}$

V = total volume of all sample canisters, in cc.

T = desired sampling time, in hours.

AC.1.0.2 NOTIFICATIONS

The collection of air samples at a site with high ambient hydrocarbon concentrations will be conducted by the QAS staff. Each participating laboratory will be advised of the sampling date three to four weeks in advance and will at that time be advised to send a clean (< 20 ppbC total hydrocarbons and < 1 ppbC speciated), evacuated, **labeled** six-liter canister to the Quality Assurance Section. Each canister should be labeled or tagged to indicate its laboratory of origin and the amount of vacuum present at the time it was delivered from the laboratory to the QAS. Canisters should be received by the QAS no later than three to four days prior to the sampling date. Sufficient prior notice to the participating labs will allow for preparation of a sampling canister and delivery time. Prior to the sampling date, each laboratory will be sent a protocol which provides, in addition to other information, the standards for analysis and the requirements for reporting results (see Figure AC.1.0.4).

Arrangements with the site operator shall be made approximately three to four weeks prior to the sampling date. The site chosen for sampling shall have adequate space available for set-up of the sampler and all canisters. The sampling set-up shall be close enough to an exit from the station to allow the sampling probe to reach from the inlet of the sampler to a point outside the station. The setup shall also be close to an electrical outlet to supply power to the sampler.

AC.1.0.3 CAUTIONS

To ensure that all canisters are filled with uncontaminated ambient air during sampling, the sample probe must extend from the inlet of the sampler to a point outside the station away from any direct sources of hydrocarbons (automobile exhaust, flues from industrial processes, etc.).

Prior to sampling, the entire system including the 910A sampler and all sample lines must be cleaned to prevent sampled ambient air from contamination (see Section AC.1.0.4). When not sampling, both ends of each sample line, as well as all manifold and sampler openings, should be capped.

AC.1.0.4 CLEANING AND VERIFICATION

At the beginning of each sampling season, the 910A sampler and all associated sampling lines should be flushed with zero air followed by ultrapure nitrogen. Verification (via lab analysis) of system purity should be conducted annually by allowing the system to sample ultrapure nitrogen under normal sampling protocol. The system is considered clean if laboratory responses following ultrapure nitrogen sampling are no higher than the analysis limit of detection. If analysis indicates contamination, repeat flushing the system with zero air and ultrapure nitrogen.

As additional verification of system cleanliness, an annual system check should be conducted using a single, non-methane hydrocarbon gas (e.g., propane) of known concentration. Analysis of the contents of a sample canister filled by the system with a known concentration of propane will reveal any contamination or leaks.



Figure AC.1.0.1  
Xontech 910A Sampler (Front & Rear Panels)

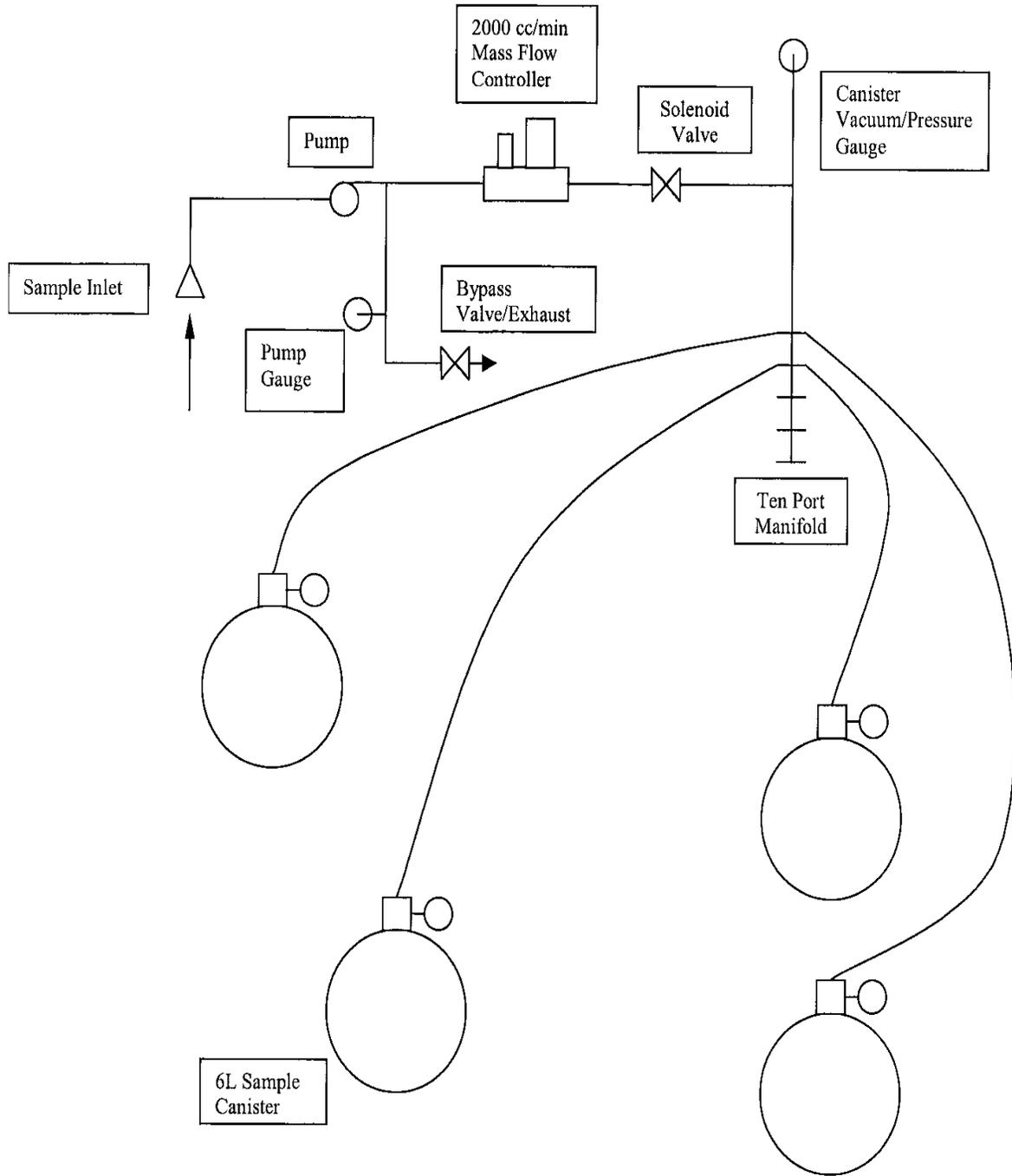


Figure AC.1.0.2  
Sampler Schematic

FLOW CALIBRATION DATA  
FOR MODIFIED XONTECH 910A

Flow Display Reading	Approximate Output Flow Rate (cc/min)	Number of 6L Canisters Pressurized to 14.7 psig in 3 Hours
4.2	63.5	1
7.6	130.6	2
11.1	202.7	3
14.4	268.3	4
17.6	335.7	5
20.3	391.4	6
23.3	454.8	7
25.7	505.2	8
30.0	593.7	9
33.2	662.1	10

Figure AC.1.0.3  
Calibration Data for Modified XonTech 910A

## PROTOCOL

### Ambient Air Non-Methane Hydrocarbon Laboratory Comparison Check August, 2002

Objective: The purpose of this comparison check is to confirm the comparability of the analytical methods currently used by those laboratories measuring ambient concentrations of non-methane hydrocarbon (hydrocarbons) compounds.

Materials: Each laboratory participating in the comparison check will submit to the Quality Assurance Section (QAS) a clean, evacuated, six-liter stainless steel canister.

Procedure: The QAS staff will conduct all sampling. Sampling will consist of drawing ambient air through an air sampler capable of filling multiple sampling canisters. Each canister will be returned to its respective laboratory for analysis. The participating laboratories will analyze the collected sample for hydrocarbons.

Participating Laboratories: The following laboratories will participate in the check:

- San Diego County Air Pollution Control District Laboratory
- Santa Barbara County Air Pollution Control District Laboratory
- South Coast Air Quality Management District Laboratory
- Ventura County Air Pollution Control District Laboratory
- U.S. EPA Technical Center, Research Triangle Park
- Georgia Department of Natural Resources, Environmental Protection Division, Air Protection Branch
- Desert Research Institute Laboratory
- Atmospheric Analysis and Consulting

Schedule: The Hydrocarbon Laboratory Comparison Check will be conducted according to the following schedule:

1. All participating laboratories shall submit one (or two in the case of San Diego Air Pollution Control District) clean, evacuated canister, to QAS. Documentation of the cleaning and evacuation process should accompany each canister. Canisters and documentation should be sent to:

California Air Resources Board, Monitoring and Laboratory Division,  
Attn: Michael Miguel, 1927 13<sup>th</sup> Street, Sacramento, CA 95812

Canisters must be received by QAS **on or before August 12, 2002.**

2. Sample canisters will be filled by QAS staff on **August 20, 2002.**

3. Sample canisters will be shipped to the respective laboratories for analysis by **August 23, 2002**.

Sample Analysis: The participating laboratories will follow their standard operating procedures in assaying the gases from the comparison check canister for concentrations of the PAMS compounds in parts per billion carbon (ppbC). Each laboratory will conduct a minimum of **two** analyses from the sample canister. **Please use caution when connecting and disconnecting the sample lines to and from the comparison check canister.**

Analysis Reporting: Each laboratory will report the results of the two analyses, and their average, for each species, as well as the sum of all hydrocarbons. Additionally, each laboratory must indicate the limit of detection for each compound. The results are to be reported within 10 working days of the analysis. All results are to be mailed to the address given below or by e-mail to [mmiguel@arb.ca.gov](mailto:mmiguel@arb.ca.gov). Alternatively, laboratories may submit results electronically using Excel 97 or Quattro Pro (Version 7.0).

California Air Resources Board, Monitoring and Laboratory Division,  
Attn: Michael Miguel, P.O. Box 2815, Sacramento, CA 95812

Quality Assurance staff will report the comparison check results to each participating laboratory along with a summary comparing the participating laboratories' test results.

Figure AC.1.0.4 (cont.)  
Protocol

## **AC.2.0 SAMPLING PROCEDURES**

### **AC.2.0.1 APPARATUS**

1. XonTech 910A Sampler: The XonTech 910A sampler used for the ambient air laboratory comparison check has been modified and calibrated especially for this procedure. The ARB property number and the equipment serial number of the modified 910A are 20004250 and 1990, respectively.
2. Sampling Canisters: Sampling canisters shall be six liters in volume and shall be equipped with a leak-free valve and a port cap. Preferably, each canister shall have a pressure/vacuum gauge with a range of -30 inches of mercury (Hg) to 30 psig. If a sampling canister is not so equipped, documentation as to the vacuum of the canister at the time it was delivered from the participating laboratory must be provided. Prior to sampling, verify that the pressure/vacuum gauge on each canister (if present) indicates that the canister has been evacuated to -30 inches Hg.
3. Manifold: The manifold used in conjunction with the 910A sampler is constructed from 1/8 inch stainless steel union crosses with a 1/4 inch nut and ferrule at the base to connect the manifold to the outlet port of the sampler. The manifold allows one to simultaneously fill from one to ten canisters. Caps should be used to cover ports on the manifold and should not be removed unless and until the port(s) are to be used for sampling.
4. Probe and Sample Lines: The probe used to sample ambient air shall be 1/4 inch stainless steel with a 1/4 inch nut and ferrule at one end to connect to the inlet port at the rear of the sampler. The length of the probe is site-specific and depends upon the length needed to have the open end of the port sufficiently away from direct sources of NMHCs. Sample lines, used to connect the manifold to canisters, shall be 1/8 inch stainless steel. Each section of sample line should be long enough to accommodate the space needed for the canisters. Sections approximately three feet long are normally adequate.

### **AC.2.0.2 PRE-SAMPLING SETUP**

The modified 910A sampler may be set up for bench top operation or may be installed into an instrument rack. In either case, space must be taken into consideration. Allow a minimum of 24 inches of clearance behind the sampler to allow sufficient space for the manifold, sample lines, and canisters. Set up the sampler as follows:

1. Place the sampler on a sturdy level surface (e.g., large table) or in a standard instrument rack.
2. Ensure that the power switch and pump switch on the front of the sampler are in the “off” position, then connect the sampler’s power cord to an AC power source.
3. Remove all caps from port openings at the rear of the sampler.
4. Connect the probe line to the sampler’s **inlet** port.
5. Connect each section of sample line to the manifold. Connect the first sample line(s) to the ports on the manifold closest to the rear of the sampler; this will aid in stabilizing the manifold. Connect successive sample lines to ports as close to the rear of the sampler as possible.
6. Carefully connect the manifold to the sampler at the **outlet** port, being careful not to torque the sampling ports on the manifold.

**Note:** The sampling ports on the manifold have been assembled so that the ports all lie in plane. Connect the manifold so that the plane of the sampling ports is parallel to the table surface or floor. Do not rotate the ports on the manifold. Rotating the ports may loosen the connections resulting in leaks.

7. Securely connect the end of each section of sample line not connected to the manifold to a sampling canister. Use a backup wrench and be careful not to twist the canister valve assembly. Bend the sample lines as necessary to accommodate all the canisters. However, do not crimp the lines. Do **not** open any of the canister valves at this time.
8. Check all probe, sample line, and manifold Connections for tightness. Tighten any loose connections as necessary.

#### AC.2.0.3 LEAK CHECK

1. With the sampling canisters connected by sampling lines to the manifold, open the valve on **one** of the sampling canisters by turning the knob located at the top of the canister counterclockwise. The canister pressure/vacuum gauge on the sampler should show a vacuum level approximately equal to that of each of the canister gauges. Once the canister’s vacuum registers on the sampler’s pressure/vacuum gauge, close the canister valve by turning the knob on top of the canister clockwise. Note the sampler gauge reading and the time.

2. Allow the sampling system (sampler, manifold, and sample lines) to remain under vacuum for approximately 10-15 minutes. At the end of this time, note the vacuum reading on the sampler's canister pressure/vacuum gauge. If there is any change in vacuum readings, check connection points at the manifold, inlet port, outlet port, and canisters. Repeat the leak check and troubleshoot the system as needed.

#### AC.2.0.4 CANISTER PRESSURIZATION

1. Set the timer override switch on the sampler to "on" (I).
2. Press the power and pump switches to the "on" position. Be sure the sampler's bypass (needle) valve is open. Allow the sampler to complete a 30-minute purge.  
  
**Note:** The XonTech 910A sampler has a pre-set purge time of 30 minutes. During this time, the sampler's solenoid valve is closed and all sample air entering the sampler is exhausted out the bypass port. At the end of 30 minutes, the solenoid valve will open and sample air will begin to flow into the canisters. The end of the 30-minute purge may be identified both by an audible "click" of the solenoid valve opening and by the movement of the elapsed sample time counter (located on the front panel directly below the potentiometer dial).
3. Immediately after the sampler's solenoid valve opens at the completion of the 30-minute purge, quickly open the valve on each canister.
4. Close the bypass valve enough to bring the pump pressure gauge reading to approximately 10-12 psi.
5. Use the flow calibration data given in Figure AC.1.0.3 and the potentiometer dial to set the value on the sampler's flow display to equal the flow required to pressurize each canister present to approximately 14 psi in three hours. A three-hour sampling period ensures sufficient final canister pressure for analysis in addition to ensuring that a representative ambient air sample is obtained.

**Note:** With the modified 910A, the flow display does not equal actual flow. Instead, the display serves as an index to the actual flow. A setting of 4.2, for example, corresponds to an actual flow of approximately 64 cc/min.

6. Check for pressure leaks at manifold connections with Snoop or liquid leak detector. Tighten as necessary.
7. Continuously monitor the digital display value on the sampler throughout the three-hour sampling period. As the pressure increases in the canisters, the display value will begin to decrease. Close off the bypass valve as necessary to maintain the original value on the sampler's digital display. Do not close the bypass valve completely.

AC.2.0.5 POST-SAMPLING PROCEDURES

1. After three hours of sampling, as indicated by the elapsed sample time counter, close all canister valves until hand-tight.
2. Press the power and pump switches to the "off" position.
3. Disconnect each of the canisters from the sample lines and replace the cap on each canister port.
4. Disconnect all sample lines from the manifold. Replace caps on both ends of each sample line.
5. Disconnect the manifold from the sampler outlet port and replace all caps on the manifold.
6. Disconnect the probe line from the sampler inlet port and replace probe line caps.
7. Replace caps on the sampler's inlet, outlet, and bypass ports.
8. Return canisters to the respective laboratories for analysis per NMHC Laboratory Comparison Check Protocol.

**AC.3.0 POST ANALYSIS DATA COLLECTION**

Following receipt of the analysis results from each participating laboratory, calculate the average concentration of the two analyses conducted for each compound. Compile the average values for each detected compound for all participating labs.

The results are presented in a table as shown in Figure AC.3.0.1.. Comparison graphs are also produced displaying all laboratory responses, as well as graphs that compare individual laboratory responses, with the average value for each detected compound. The graphs are presented in Figure AC.3.0.2..

**2001 Ambient Air Laboratory Comparison Check**

COMPOUND	ARB-9048	ARB-5014	DRI	EPA	SB	SD	Georgia	SC-Pico	SC-Pams	AAC	Ventura	Adj.	Std
	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	Mean	Dev.
Ethylene	9.8	9.9	10.8	11.6	10.9	11.1	9.0	10.8	10.7	9.2	10.1	<b>10.3</b>	0.84
Acetylene	7.8	7.6	10.0	9.6	8.0	10.0	4.7	9.7	9.8	7.8	7.6	<b>8.8</b>	1.78
Ethane	15.6	15.6	16.9	18.8	17.1		16.2	17.9	16.3	15.1	17.0	<b>16.6</b>	1.13
Propylene	3.1	3.5	3.2	3.7	3.8	3.7	3.1	3.8	3.5	2.7	3.1	<b>3.4</b>	0.37
Propane	29.0	28.7	33.9	34.7	33.5	33.4	31.0	35.2	32.4	30.2	32.9	<b>33.0</b>	2.05
Isobutane	16.2	16.1	18.7	19.0	17.3	18.2	16.1	19.3	17.3	16.1	18.1	<b>17.4</b>	1.29
1-butene	NR	NR	0.5	0.6	2.1	NR	0.5	0.6	0.5	2.7	2.1	<b>0.5</b>	0.64
n-butane	13.8	13.8	15.8	16.0	16.2	15.4	13.8	15.7	14.6	12.6	15.3	<b>14.8</b>	1.24
Trans-2-butene	NR	NR	0.1	NR	NR	0.5	0.4	NR	NR	NR	0.5	<b>0.4</b>	0.19
cis-2-butene	NR	NR	0.1	0.3	NR	0.4	0.3	NR	NR	NR	23.0	<b>0.3</b>	0.13
Isopentane	NR	NR	21.1	22.7	25.0	26.9	20.2	23.7	26.1	15.5	8.5	<b>23.4</b>	5.85
1-pentene	1.5	1.4	0.8	NR	1.2	1.6	0.2	3.0	1.4	1.0	NR	<b>1.3</b>	0.81
n-pentane	9.0	9.0	8.2	9.0	10.2	9.5	7.0	8.9	11.5	8.1	NR	<b>9.0</b>	1.29
Trans-2-pentene	NR	NR	NR	0.2	0.4	0.4	0.1	NR	0.4	NR	0.3	<b>0.3</b>	0.13
2,2-dimethylbutane	2.0	2.0	2.0	2.3	2.3	1.7	0.8	2.0	2.4	1.8	NR	<b>1.9</b>	0.48
Cyclopentane	1.0	1.0	0.9	1.1	1.1	1.1	1.0	1.0	1.3	0.8	NR	<b>1.0</b>	0.14
2,3-dimethylbutane	2.5	2.4	2.4	1.9	2.7	2.7	1.0	2.4	2.9	2.5	NR	<b>2.3</b>	0.57
2-methylpentane	7.4	7.2	6.4	9.9	10.4	6.8	3.2	7.0	11.0	7.2	5.8	<b>7.2</b>	2.36
3-methylpentane	4.6	4.5	3.9	4.9	5.2	NR	2.9	4.4	5.6	5.4	4.1	<b>4.5</b>	0.85
n-hexane	3.9	4.1	3.6	4.2	4.2	3.6	4.1	3.2	4.1	22.6	4.1	<b>3.9</b>	5.92
Methylcyclopentane	4.4	4.4	4.1	5.0	4.7	4.6	4.2	4.7	5.2	6.8	4.6	<b>4.8</b>	0.80
2,4-dimethylpentane	1.9	1.9	1.7	2.3	2.1	1.9	1.9	2.0	2.4	2.0	1.8	<b>1.9</b>	0.23
Benzene	5.0	4.9	4.9	5.5	5.0	5.0	4.2	4.8	5.0	5.2	5.0	<b>4.9</b>	0.33
Cyclohexane	2.1	2.1	2.1	2.5	2.1	1.9	1.7	2.0	2.5	2.9	2.1	<b>2.1</b>	0.35
2-methylhexane	2.9	2.9	2.6	4.4	4.0	2.8	2.2	2.5	3.2	3.5	3.0	<b>2.8</b>	0.69
2,3-dimethylpentane	3.1	3.1	2.8	3.5	3.1	3.5	3.3	3.2	4.5	4.5	3.3	<b>3.4</b>	0.58

Figure AC.3.0.1  
Ambient Air NMHC Laboratory Comparison Check Results

**2001 Ambient Air Laboratory Comparison Check**

COMPOUND	ARB-9048	ARB-5014	DRI	EPA	SB	SD	Georgia	SC-Pico	SC-Pams	AAC	Ventura	Adj.	Std
	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	(ppbc)	Mean	Dev.
3-methylhexane	3.8	3.9	3.2	5.6	4.6	3.2	2.8	3.0	4.1	4.9	4.0	<b>3.9</b>	0.91
2,2,4-trimethylpentane	5.2	5.2	5.1	6.7	6.8	5.0	5.9	5.1	7.0	5.8	6.5	<b>5.8</b>	0.79
n-heptane	2.9	2.9	2.6	3.1	2.9	2.6	2.6	1.9	3.0	4.2	2.8	<b>2.8</b>	0.58
methylcyclohexane	3.3	3.3	2.7	3.3	4.7	3.4	2.8	3.1	3.8	3.0	3.4	<b>3.4</b>	0.57
2,3,4-trimethylpentane	2.0	1.9	1.7	2.3	1.9	1.9	1.9	1.9	2.1	2.4	1.9	<b>1.9</b>	0.21
toluene	20.6	20.6	18.8	23.2	20.6	19.5	20.4	17.0	20.5	29.0	20.8	<b>20.2</b>	3.21
2-methylheptane	1.4	1.4	1.4	1.9	2.3	1.3	1.3	1.1	1.9	2.0	1.4	<b>1.5</b>	0.39
3-methylheptane	1.5	1.6	1.2	1.4	1.3	1.5	1.3	1.2	0.3	1.5	1.6	<b>1.3</b>	0.38
n-octane	2.2	2.2	1.9	1.7	0.6	2.0	2.2	1.4	2.2	3.5	1.7	<b>1.9</b>	0.73
ethylbenzene	3.0	3.0	2.7	3.2	3.3	2.9	2.8	2.5	3.5	3.1	2.7	<b>2.9</b>	0.31
m/p-xylene	8.6	8.3	8.5	9.2	8.5	8.4	8.2	8.3	8.4	8.7	8.5	<b>8.5</b>	0.28
styrene	NR	NR	NR	NR	2.9	1.0	0.7	NR	1.5	1.7	0.8	<b>1.1</b>	0.82
n-nonane	1.7	1.8	1.7	2.1	2.0	1.6	1.4	1.3	2.1	1.9	1.7	<b>1.7</b>	0.28
isopropylbenzene	NR	NR	0.4	0.5	0.5	NR	0.1	NR	0.5	NR	NR	<b>0.4</b>	0.17
n-propylbenzene	1.1	1.1	1.0	1.2	1.1	1.0	0.6	1.4	1.2	0.9	0.7	<b>1.0</b>	0.24
m-ethyltoluene	2.3	2.5	2.3	3.0	3.1	2.0	2.0	1.4	2.7	2.4	2.5	<b>2.3</b>	0.50
p-ethyltoluene	1.1	1.2	1.3	1.8	1.9	2.2	1.3	2.4	2.0	1.7	0.9	<b>1.6</b>	0.51
1,3,5-trimethylbenzene	NR	NR	1.0	2.5	1.3	0.8	0.6	0.9	1.4	1.0	0.9	<b>1.0</b>	0.56
o-ethyltoluene	1.1	1.1	1.2	1.5	1.6	2.3	1.1	1.8	1.0	1.0	0.9	<b>1.2</b>	0.45
1,2,4-trimethylbenzene	3.3	3.2	2.3	4.3	4.3	3.0	2.4	4.1	3.5	3.0	3.1	<b>3.3</b>	0.72
n-decane	2.3	2.5	2.0	2.2	2.3	2.0	2.1	2.3	2.3	1.5	1.9	<b>2.2</b>	0.29
1,2,3-trimethylbenzene	NR	NR	1.1	1.2	0.9	0.9	0.5	3.1	2.6	0.6	1.4	<b>0.9</b>	0.89
m-diethylbenzene	NR	NR	0.4	NR	1.2	0.4	0.5	1.0	0.6	NR	0.4	<b>0.6</b>	0.33
p-diethylbenzene	NR	NR	0.8	2.7	1.7	NR	0.5	2.6	1.3	NR	NR	<b>1.1</b>	0.91
n-undecane	1.9	1.9	2.4	2.6	2.5	2.1	1.2	2.7	2.3	2.2	2.5	<b>2.3</b>	0.44
<b>Total NMOC</b>	200.2	199.4	235.5	285.8	282.8	242.1	215.8	272.4	284.3	279.8	204.5	N/A	34.96

(cont.) Figure AC.3.0.1  
Ambient Air NMHC Comparison Check Results

### 2001 Ambient Air NMHC Laboratory Comparison Check

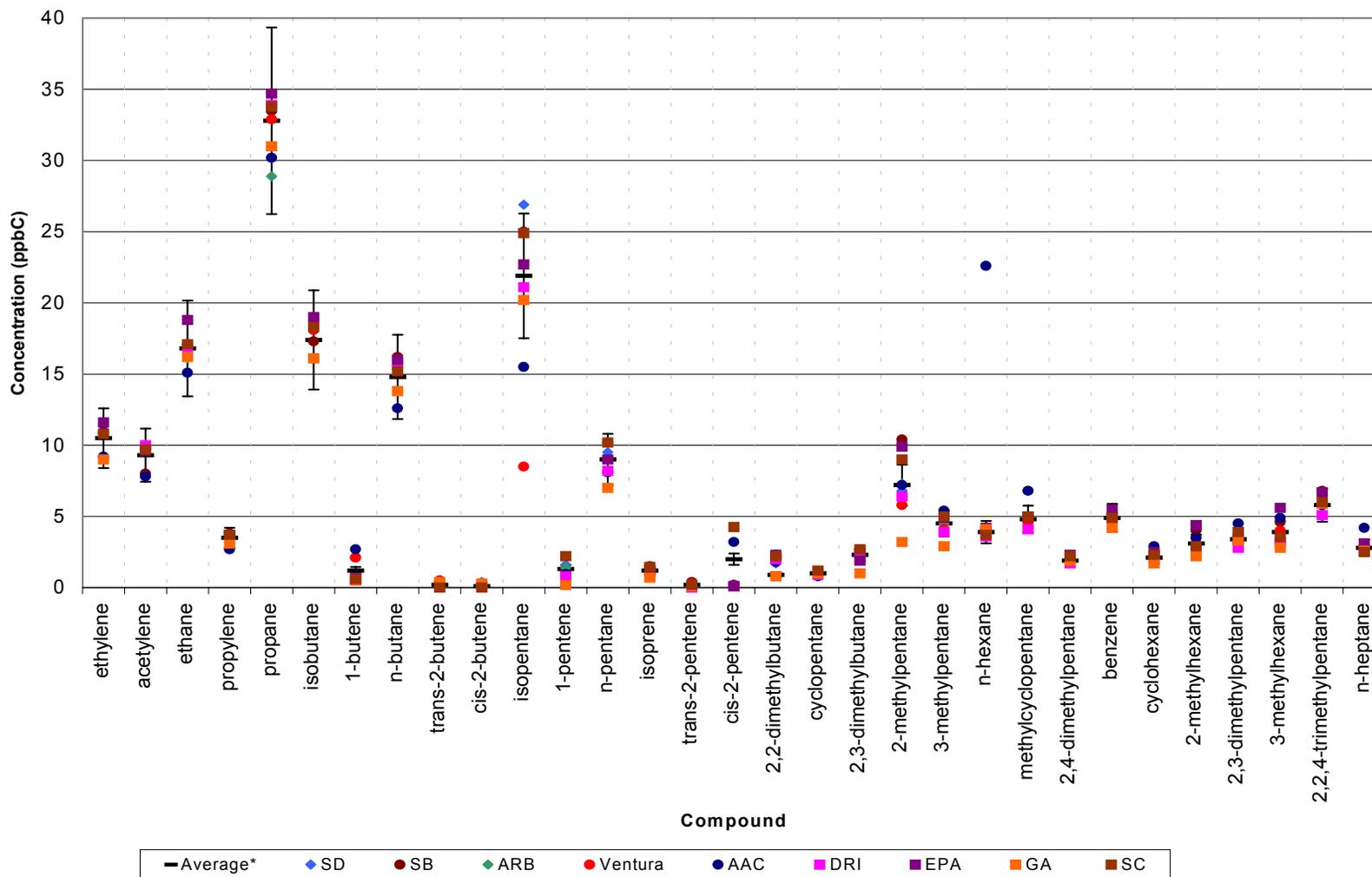
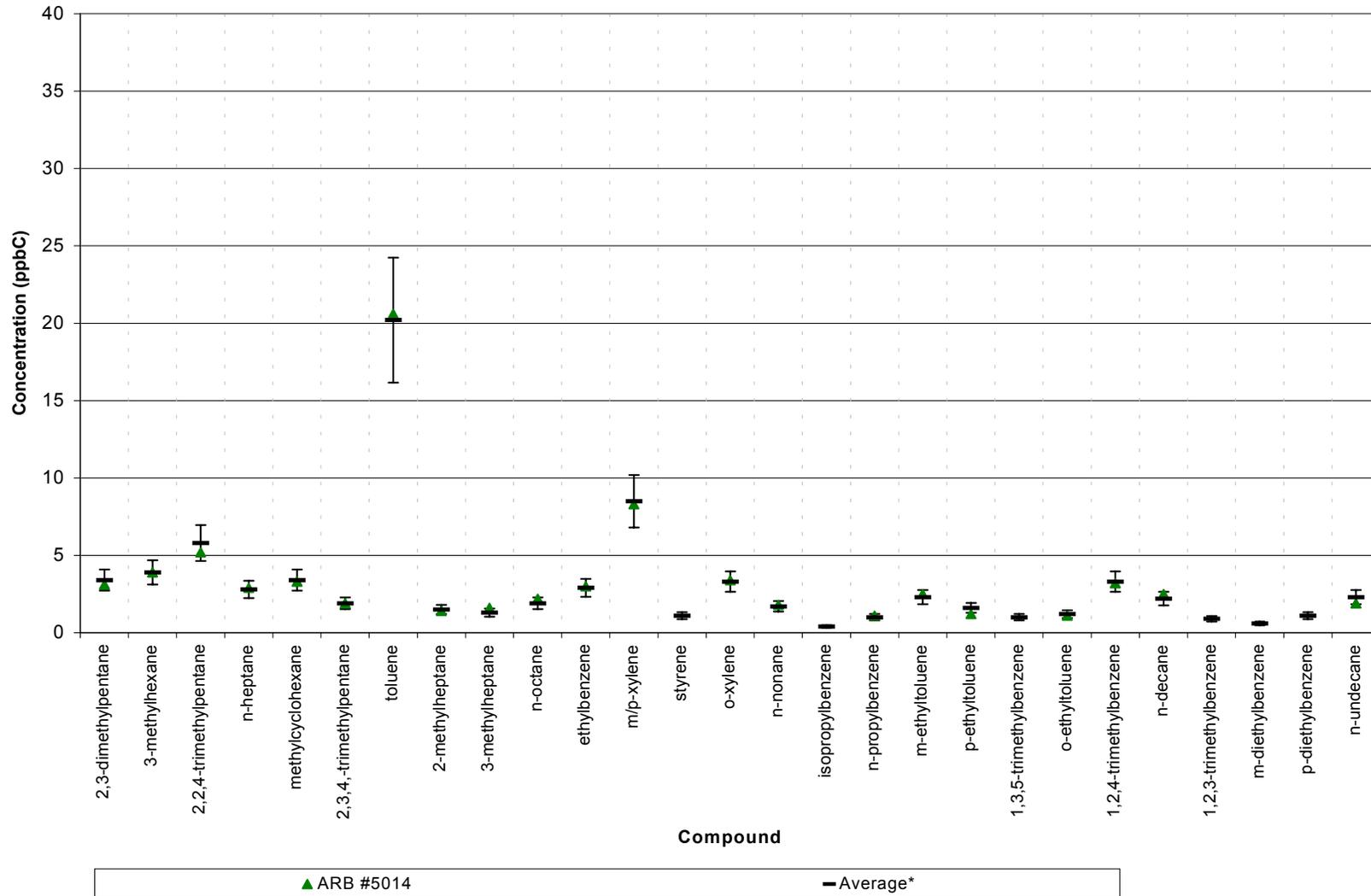


Figure AC.3.0.2  
 Ambient Air NMHC Laboratory Comparison Check Graphs

2001 Ambient Air NMHC Laboratory Comparison Check  
 California Air Resources Board # 5014



(cont.) Figure AC.3.0.2  
 Ambient Air NMHC Laboratory Comparison Check Graphs