STATE OF CALIFORNIA

AIR RESOURCES BOARD

AIR MONITORING QUALITY ASSURANCE

VOLUME II

STANDARD OPERATING PROCEDURES
FOR
AIR QUALITY MONITORING

APPENDIX Q
XONTECH MODEL 910A SAMPLER
AND
XONTECH MODEL 912 SAMPLING ADAPTER

MONITORING AND LABORATORY DIVISION

MARCH 1996

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STATE OF CALIFORNIA

AIR RESOURCES BOARD

AIR MONITORING QUALITY ASSURANCE

VOLUME II
STANDARD OPERATING PROCEDURES
FOR
AIR QUALITY MONITORING

APPENDIX Q.1
STATION OPERATOR'S PROCEDURES
FOR
XONTECH MODEL 910A SAMPLER

MONITORING AND LABORATORY DIVISION

MARCH 1996

Q.1.0 GENERAL INFORMATION

Q.1.0.1 SAMPLER OPERATION

The Toxic Monitoring Network uses a XonTech Model 910A gaseous sampler to collect a representative sample of ambient air over a 24 hour period for later laboratory analysis. Sampling is conducted every 12 days at 21 sites statewide. Samples are collected in stainless steel canisters (with a SUMMA polished interior coating of chrome-nickel oxide). SUMMA coated stainless steel is an inert material which will not react with pollutants in the ambient sample. The airflow to the canister is uniformly maintained in order to fill to a sufficient volume for laboratory analyses as well as to obtain a representative sample. The sampling apparatus must not be exposed to extraneous compounds such as hydrocarbon solvents or calibration gases, which could interfere with subsequent analysis. Avoiding contamination is critical since the organic compounds measured are present in very low concentrations, generally in the 0.01 to 20 parts per billion (ppb) range.

Non-methane organic compounds (NMOC) are sampled seasonally (July to September) at 11 sites statewide. Sampling is conducted over 4 separate 3-hour periods every 3 days for trend analysis. In addition, if it is determined conditions are good for NMOC generation, an episode is declared and the 910A sampler collects 4 different 3-hour periods on this episode day. The trend and episode analysis runs are part of the Photochemical Assessment Monitoring Station (PAMS) program. NMOC canisters are collected through the XonTech 912 Multi-Channel Sampling Adapter whose operation is described in Section Q.3.0.

The XonTech 910A gaseous sampler is equipped with a quartz electronic timer for pre-selecting the sample run time and an elapsed time meter which measures and displays the total sampling time. All important timers, gauges, meters, and switches are located on the front of the instrument. Gaseous samplers generally contain a mass flow controller, a K.N.F. pump, pressure gauge, by-pass valve, cooling fan, sample inlet and outlet ports, and exhaust port. In addition, the Model 910A has a solenoid valve to allow for a pre-sample purge of the sampler and connecting lines. (This purge time is adjusted in five-minute increments between 0 - 60 minutes; ARB uses a 30-minute purge time.) A second gauge is used to measure both vacuum and pressure in the canister.

Q.1.0.2 FLOW SYSTEM

The flow diagram for the XonTech 910A sampler is shown in Figure Q.1.0.1. A description of the XonTech 910A flow system is covered in the manufacturer's operations and maintenance manuals (Model 910A Sampler).

Q.1.0.3 TIMER CONTROLS

All programming and sample flow "ON/OFF" is accomplished using the push button switches on the timer. Switches for the XonTech 910A sampler are described below.

1. θ - Initiates setting the time of day. A push button is located in the top row.

   NOTE: This is the only button that halts the clock. The clock will continue to run while setting or checking any other function.

2. I/0 - Used to program the "ON" (I) and the "OFF" (0) times.

3. h - Used to program the hour digit. This button increments one hour for each momentary press or advances hours at a fast rate when held.

4. m - Used to program the minute digit. This button increments one-minute for each momentary press or advances minutes at a fast rate when held.

5. 1-7 - Used to program the day or days of the week. This button increments one day for each momentary press or advances days at a fast rate when held.

6. ch - Used to check or recall the programs in memory.

7. Q - Used to confirm the selection of the days of the week.

8. pr - Enters completed program into memory. Also used to exit from check (ch) mode and return display to actual time of day.

9. C - Used to clear last digit if an error is made by programming. Also clears program when reprogramming. Use a ballpoint pen or other pointed object to depress this button.

10. R - Used to clear all programs in memory, including time of day. Use a ballpoint pen or other pointed object to depress this button.

11. Manual Timer Override Switch (BDI) - Located in the lower left corner under display.

    0 - Corresponds to "OFF". Turns off flow so that timer cannot turn on flow.

    I - Corresponds to "ON". Turns on flow at the set flow rate. Allows setting flow rate without using timer.

    θ - Turns on timer so that programmed timer will control the "ON" and "OFF" of the flow. This is the normal setting.

Q.1.0.4 ELECTRICAL SYSTEM

1. Wiring diagram for the XonTech 910A gaseous sampler is shown in Figure Q.1.0.2.

2. Clock Operation - The power switch (51) is the master power switch and provides power to the sampler. When the pump switch (52) is on, power is supplied directly to the pump only. When manual timer (BD1) override switch is in "I" position, the fan, pump, flow controller, and flow indicator are activated for testing the sampler and setting the flow rates. When the override switch is on "θ", operation is dependent on the timer setting. Setting the override switch to "OFF" allows only the clock to continue running without any program activation.

    NOTE: The timer's memory remembers any time the unit was turned on. Thus, if you ran a 20 minute operational check, the next timed run will be 20 minutes short. Therefore, after each operational check, turn the power switch off and the timer switch off for approximately 10 seconds. This will reset the timer.

Q.1.0.5 CAUTIONS

The sampler is used to collect a representative ambient sample for analysis of chemical components that are in the ppb or sub-ppb concentration range. When the sampler is not running or not in use every effort must be made to keep it clean and, if possible, in a clean environment. Cap the sample outlet line when the sampler is not in use, or connect the outlet line to a clean canister.

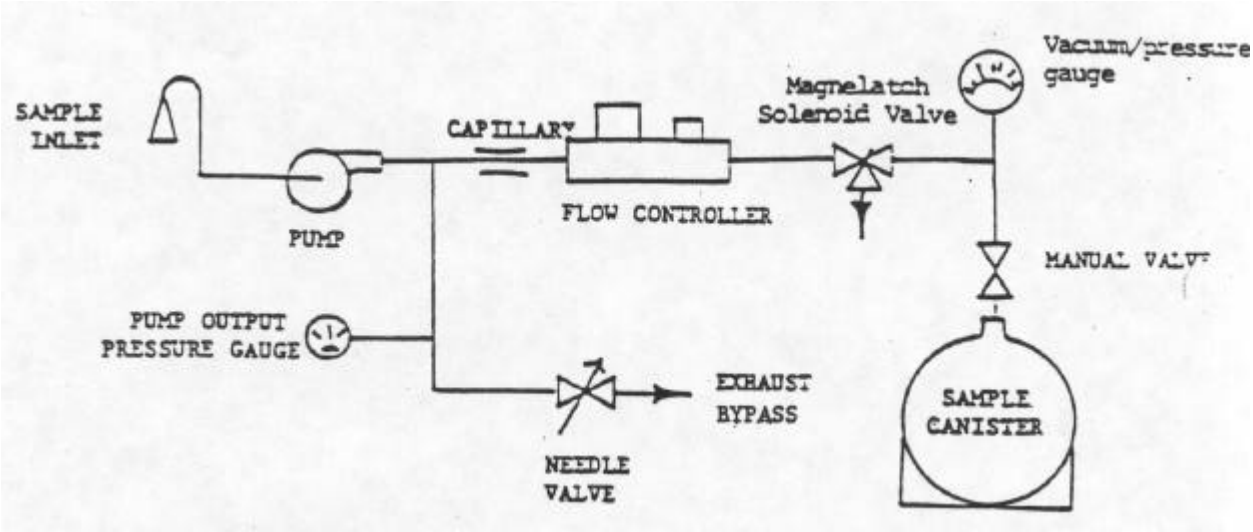


Figure Q.1.0.1
XonTech Model 910A Flow Diagram

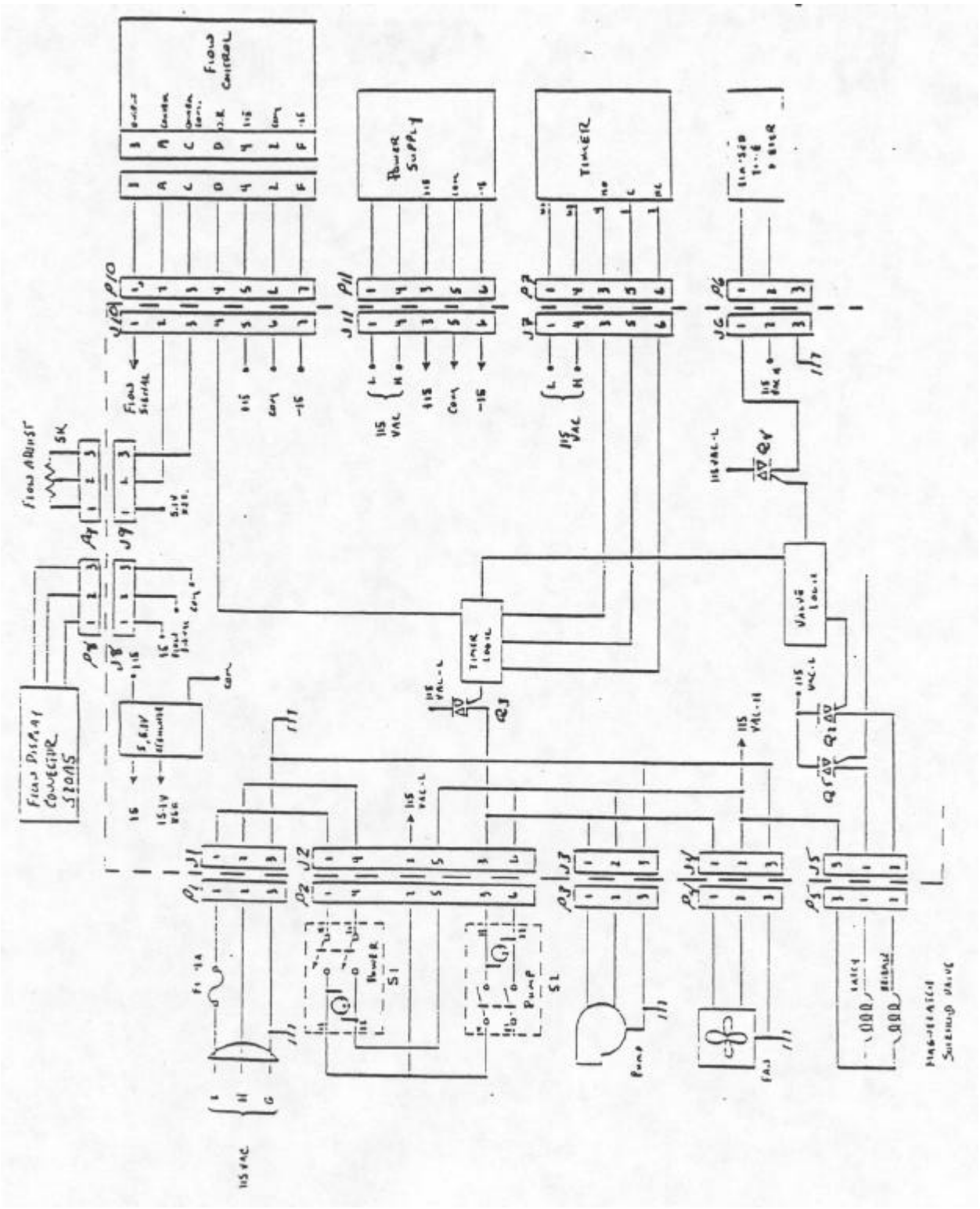


Figure Q.1.0.2
XonTech Model 910A Sampler Wiring Diagram

Q.1.1 INSTALLATION PROCEDURES

Q.1.1.1 PHYSICAL INSPECTION

When the XonTech 910A gaseous sampler is received, verify that the unit is complete. Inspect the sampler for any physical damage such as scratched panel surfaces (new units only) and broken knobs or connectors. Remove the six (6) screws in the top cover and remove the cover to observe the interior. Visually check inside the unit for loose or damaged components, confirm that the purge delay time is set at 30 minutes, then replace the **cover** and reinstall the screws. Keep the original packing and shipping container until inspection of the sampler is completed. If damage is found, file a claim with the responsible carrier or call the Instrument Laboratory at (916) 324-7332.

Q.1.1.2 INITIAL SET-UP/INSTALLATION

The sampler is designed for bench top operation or installation into a standard 19" rack. Use Aculife treated stainless steel tubing and Swagelock-type fittings. Connect the power cord and plumb the fittings on the rear of the cabinet for ambient air inlet and sample outlet use, as follows:

1. Connect 1/8" O.D. Aculife treated stainless steel tubing to the 1/8" stainless steel port marked **"OUTPUT"** on the rear of the sampler using stainless steel ferrules and nuts. A 1/4" to 1/8" Swagelock adaptor will be provided to connect the valve on the canister to the Aculife stainless steel tubing.

2. Route the tubing to the canister. The tubing length should be kept to a minimum. It is not necessary to remove the canister from the metal shipping box before making the connection.

   NOTE: The 1/8" stainless steel tubing should terminate at the canister end in a 1/4" brass nut and ferrule.

3. Connect the 1/4" Teflon inlet probe tubing to the sampler at the rear **"INLET"** port. For NMOC samplers, connect the 1/4" Aculife treated stainless steel tubing and Swagelock-type fittings to the rear **"INLET"** port.

Q.1.1.3 PRIMARY POWER CONNECTION

The sampler operates on 105 to 125 volts, 60 Hz, single-phase power. The power required is approximately 200 watts. Prior to connecting the AC power cord to the power source, insure that the power switch is in the "OFF" position.

To protect operating personnel, the National Electrical Manufacturer's Association recommends that the sampler be grounded. The sampler is equipped with a three-conductor power cable that automatically grounds the sampler when the appropriate outlet is used. The round pin on the power cable is the ground pin connection. To retain the protection feature when operating the sampler, a three-conductor outlet must be provided.

When the sampler is first powered on, the manual timer override switch should be in the "OFF" position. When the power switch is turned on, the unit will run momentarily and shut itself off. This will set the logic card for proper operation of a 30-minute purge.

Q.1.2 SAMPLING PROCEDURES

This section contains operating instructions for the XonTech 910A gaseous sampler. These instructions also include the identification and function of the controls, gauges, flow meter, and the inlet and outlet ports.

Q.1.2.1 CONTROLS AND INDICATORS

The controls and indicators of the XonTech 910A sampler are illustrated in Figure Q.1.2.1. Inlet and outlet ports are illustrated in Figure Q.1.2.2. Prior to the operation of the unit, it is recommended that the operator become familiar with the function of each control and indicator.

Q.1.2.2 PRE-RUN PROCEDURE

1. Canister and Timer Setup

    a. Make sure the valve (green knurled knob) is closed before removing the cap on the canister. CLOCKWISE CLOSES! Uncap the canister and set the Swagelock cap aside for use after sampling is completed. Remember to use a backup wrench to hold the valve body when removing the cap.

    b. Do not open the canister inlet valve at this time. Connect the sample output line from the sampler to the canister being careful to use a wrench to support the valve body while tightening the Swagelock nut onto the valve.

    c. Program the sampler timer for the appropriate start and stop times to achieve a 24 hour sample, making sure no other sample times have been left on the timer. Canister samples are to be run from midnight to midnight. Because of the initial 30-minute purge, the start time should be initiated at 2330 PST the day prior to the scheduled sample. The correct termination clock time should be 2359 PST of the day of the scheduled run.

    d. Set the timer override switch to "I" (ON position).

e. Adjust the sampler pressure to a reading of 20 psig on the back pressure gauge (see table on following page for sampler and canister operating conditions). Record the pressure in the XonTech 910A Toxics Data Sheet or XonTech 910A NMOC Data Sheet (see Figure Q.1.2.4 and Figure Q.1.2.6) and the Monthly Quality Control Maintenance Checksheet (Figure Q.1.2.8).

f. Check that the Flow Adjust Controller (V2 in Figure Q.1.2.1), also known as the duo-dial potentiometer, is set to the correct set point, and that the digital flow meter display value (FM1 in Figure Q.1.2.1) also indicates the correct set point. Record the flow meter reading in the MFC block of the data sheet. The correct set point for the duo-dial potentiometer should have been previously calibrated/checked and recorded on a label on the instrument by either laboratory or air monitoring calibration staff. Determination of the potentiometer set point and resultant flow meter display is necessary because the digital display value may not numerically equal the sampler's true flow rate, but is related by appropriate calibration.

Toxic Sampler/Canister Operating Conditions

Pump Model No.	MPU-463-N010
Sample Run Time	24 hours
Sample Nominal Flow	7.6 ccm
Back Pressure	20 psig
Final Canister Pressure	8.0 - 16.0 psig
Probe Flow	1.5 - 3.5 LPM

NMOC Sampler/Canister Operating Conditions

Pump Model No.	MPU-463-N010
Sample Run Time	3 hours
Sample Nominal Flow	60 ccm

Back Pressure	20 psig
Final Canister Pressure	8.0 - 16.0 psig
Probe Flow	1.5 - 3.5 LPM

g. Set the timer override switch "θ" (program timer position). The pump should shut off after a few seconds.

h. Zero the elapsed time meter if adjustable. Record the actual reading on the Monthly Quality Control Maintenance Checksheet (Figure Q.1.2.8) under Start Time.

i. Open the canister inlet valve by turning the green knurled knob counterclockwise. After the sampler gauge shows a vacuum reading, close the canister valve and record the sampler gauge reading on the XonTech 910A Toxics or NMOC Datasheet in the "Setup Vacuum" box and "Start Vac. 910A" of the Monthly Quality Control Maintenance Checksheet. After one (1) hour, or time available at site if less than an hour, take another gauge reading and record in the "Check Vacuum" box of the toxics datasheet and the difference in the "Leak Test" box on the Monthly Quality Control Maintenance Checksheet. Enter the elapsed time between these two (2) readings in the "Check Minutes.' box. If there is any change in vacuum readings, troubleshoot the leak (verify canister connection and bulkhead adapter fittings are tight) and repeat the test. Do not proceed with the sampling if the leak persists, but contact the Air Monitoring Section of the ARB for further instructions.

CAUTION: - Use only brass Swagelock fittings on the Nupro valve.

- Do not over tighten valve. Recommended torque value is 18 in. lbs or less.

- Use only brass plugs to avoid damage to the valve fitting seat and threads.

- Do not use Teflon tape on Swagelock fittings. It may cause contamination.

- Use a backup wrench when tightening connections.

Q.1.2.3 POST-RUN PROCEDURES

1. Canister Removal

   a. After the operational period, close the inlet valve on the canister by turning the green knurled knob clockwise using modest pressure. Do not over tighten.

   b. Note and record all canister and sampler gauge readings on the XonTech 910A Toxics or NMOC Data Sheet and the Monthly Quality Control Maintenance Checksheet.

   c. Disconnect the sampler output line from the canister and cap this line or connect it to a clean canister to prevent any contamination of the sample line. Cap the canister with the Swagelock cap.

   d. Place the timer override switch on “0” position (OFF) to prevent the Unit from running on an unscheduled week. Another option to prevent an unscheduled run is to "clear" the existing program by first pressing "ch” to display the program and then pressing "C" to clear it.

   e. Record the final elapsed time meter reading on the Monthly Quality Control Maintenance Checksheet.

      NOTE: If you perform any subsequent operational check runs on the sampler, before the next 24 hour run you must turn the power switch off and timer switch to off for approximately 10 seconds in order to reset the timer.

Q.1.2.4 DATASHEET

Record on the Toxics or NMOC Datasheet (Figure Q.1.2.4 or Q.1.2.6) the site number, site name, start and stop dates and times, the setup flow meter reading in cubic centimeters per minute (ccm), the pressure and/or vacuum readings (PSI/" Hg), and results of setup leak tests. Instructions for filling out the Toxics and NMOC Datasheets are shown in Figures Q.1.2.5 and Q.1.2.7. Put the datasheet inside the sample metal shipping box.

Q.1.2.5 MONTHLY OUALITY CONTROL MAINTENANCE CHECKSHEET

Record all pertinent information for each run on the Monthly Quality Control Maintenance Checksheet, MLD-135 (scheduled date, run date, collection method, comments, etc.) and forward monthly to the appropriate ARB Air Monitoring Section. A sample log is shown in Figure Q.1.2.8.

Q.1.2.6 SAMPLE SHIPMENT

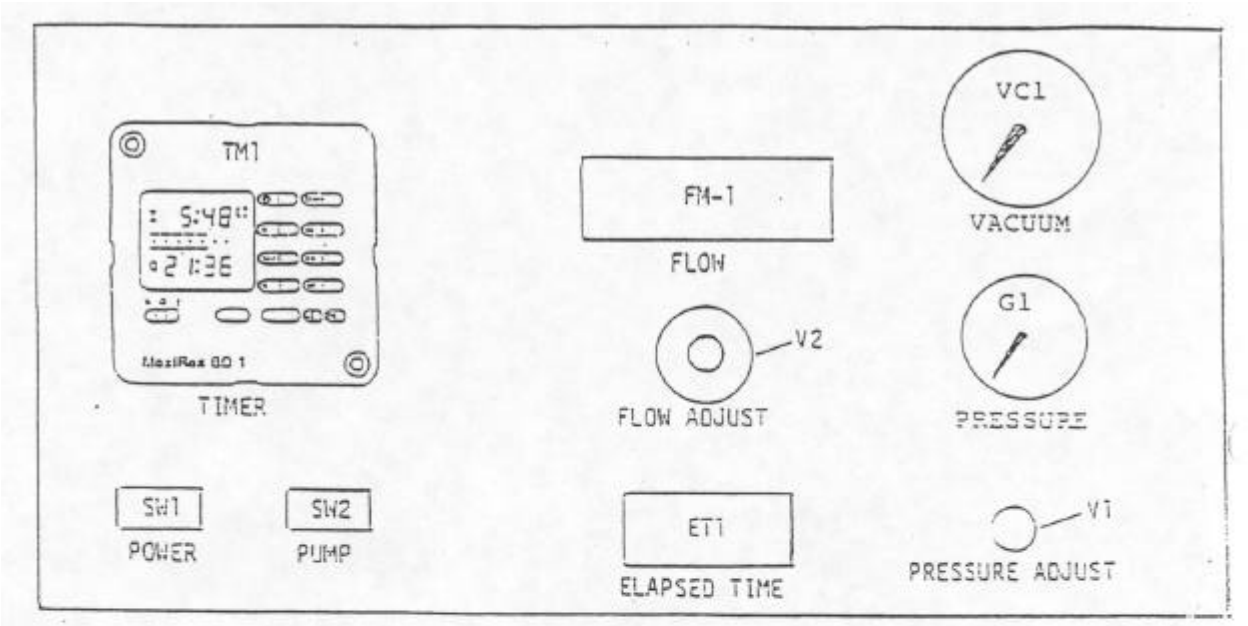
Prepare the container for shipping to the Engineering and Laboratory Branch, 1309 T Street, Sacramento, CA 95814. The sample must be shipped to Sacramento as soon as possible for analysis.

Q.1.2.7 SAMPLING SCHEDULE

The XonTech 910A toxic sampling schedule will be an every 12-day sample coinciding to the PM10 schedule. Sites south of the Tehachapis, sampling will be on one 12-day schedule and sites north of the Tehachapis will be offset by six days. The toxic Sampling Schedules for 1996 - 1997 are contained in Figure Q.1.2.9 (pp.13-16). The NMOC sampling schedules are sent to field operators annually during the second quarter and cover the July to September period.

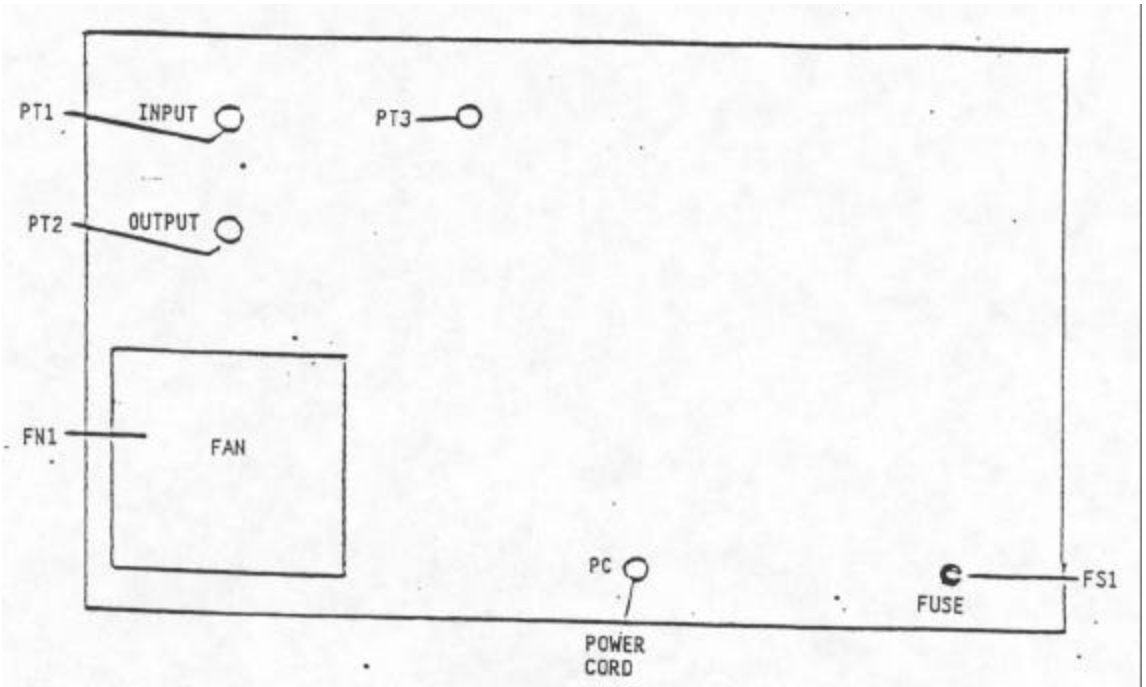
Q.1.2.8 INTERIM PARALLEL SAMPLING

At the three collocated toxic 910A sites (Riverside-Rubiduoux, Bakersfield, and Concord) parallel sampling is performed using primary and collocated samplers and SUMMA canisters.



Symbol	Name	Function
SW1	POWER switch	Main power switch - applies power to sampler
SW2	PUMP switch	Applies power to sample pump independent of timer (except in some newer units)
V1	PRESSURE SET valve	Adjusts sample pressure to controller
V2	FLOW ADJ controller	Sets and maintains sample flow to canister. This knob is also referred to as the duo-dial potentiometer.
G1	PRESSURE gauge	Indicates pressure to controller
VC1	VACUUM gauge	Indicates vacuum pressure in canister
ET1	ELAPSED TIME meter	Indicates sample run time in total minutes
FM1	FLOW METER display	Indicates flow rate of sampler to canister
TM1	TIMER/CLOCK	Set to operate on desired day for 24 hour run time

Figure Q.1.2.1
XonTech Model 910A Sampler, Front Panel



Symbol	Name	Function
PT1	INLET	Sample inlet port
PT2	OUTLET	Sample outlet port
PT3	EXHAUST BYPASS	Sample excess port
FN1	FAN	Cooling fan
FS1	FUSE	3 amp 3AG fuse
PC	POWER CORD	Connector to 110V

Figure Q.1.2.2
Sampler Back Panel

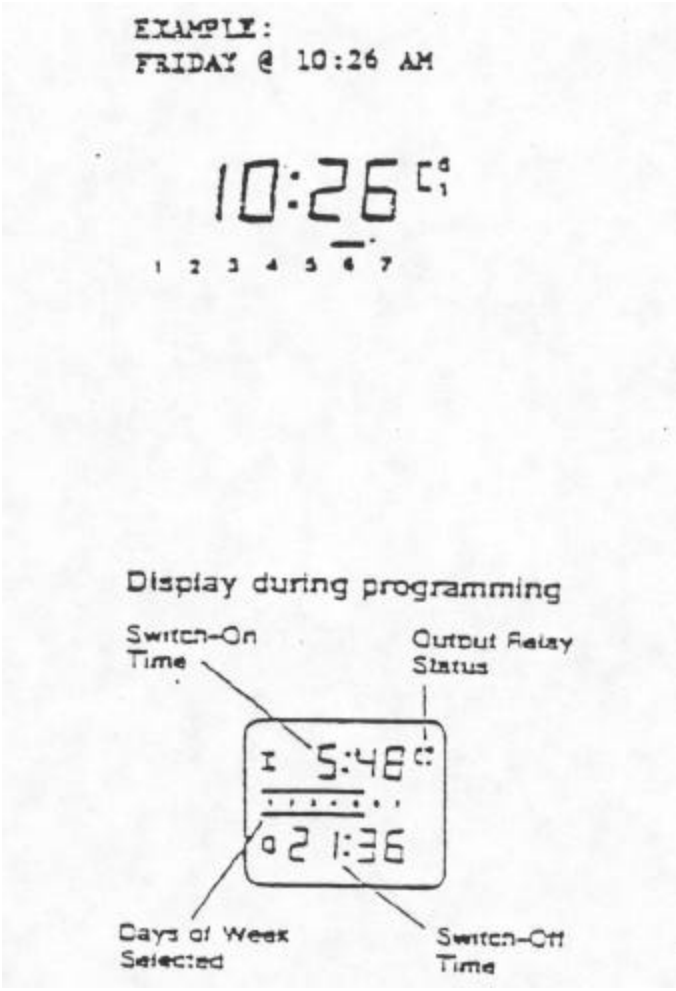


Figure Q.1.2.3
Timer Display

[Place data sheet inside plastic pouch. Questions? Call the lab (916) 324-6863] **TOXICS**

CALIFORNIA AIR RESOURCES BOARD
Xontech 910A Toxics Data Sheet

Site Name: _____ Site Number: _____

Station Operator: _____ Sampling Date: _____

			CANISTER					SAMPLER			
	DATE	TIME (PST)	VACUUM ("Hg)		PRESSURE (psi)			MFC READING	BACK PRESSURE READING	BEGINNING VACUUM	ENDING PRESSURE (psi)
			LAB	FIELD							
Set-Up											
Start											
					FIELD	LAB	LAB*				FIELD
Stop											

* Calibrated Gauge

Type of Sample: [ ] Regular [ ] Collocated [ ] Make-up [ ] Special Study

Canister ID Number: _____ Air Sampler ID Number: _____ Date Shipped from field: _____

Sampling Conditions [ ] No Unusual Conditions [ ] Farm Operation Nearby [ ] Rain
[ ] Wind-Blown Sand/Dust [ ] Fire Nearby
[ ] Construction Nearby [ ] Other _____

INVALID SAMPLE? [ ] NO or [ ] YES

Reason for sample invalidation:
- [ ] Low canister pressure
- [ ] High canister pressure
- [ ] Sampling period out of range (<23 or >25 hours)
- [ ] Sampling equipment inoperative
- [ ] Damaged sampling media
- [ ] Lab unable to provide sample media
- [ ] Other reasons: _____

Status of make-up sample:
- [ ] Will run make-up on _____
- [ ] Lab unable to provide sample media
- [ ] Unable to collect make-up, equipment needs repair/replacement/calibration, notified Supervisor

Field Comments:

FOR LABORATORY USE

Shipped to field:
Initials: _____ Date: _____ Time: _____

Received in lab:
Initials: _____ Date: _____ Time: _____

Lab Comments:

Bar Code:

LIMS Sample ID:

Figure Q.1.2.4
XonTech 910A Toxics Datasheet

INSTRUCTIONS FOR XONTECH 910A TOXICS SAMPLING

	DATE (PST)	TIME	CANISTER Vacuum ("Hg) Lab	Field	SAMPLER MFC Reading	Pump Pressure	Set-Up Vacuum	Check Vacuum	Check Minutes
Set-Up			1	2	3	4	5	6	7
Start			Pressure (PSI) Lab	Field	Lab				
Stop			10	8	11			End Pressure (PSI) 9	

1. The laboratory (lab) staff records the canister vacuum reading before the canister is delivered to the field.

2. The field operator records the canister vacuum gauge reading before the run. The vacuum reading recorded by the field operator should be the same as the vacuum recorded by the lab staff. If it is not the same, the canister has a leak. Do not use the canister. Set-up another canister for sampling.

3. The field operator records the mass flow controller reading on the sampler before the run. The flow should be set such that the actual flow rate is about 7.6 ccm.

4. The field operator records the back pressure gauge reading on the sampler before the run. The sampler backpressure reading should be set at 20 psi.

5. The field operator records the canister pressure reading on the sampler after the canister has been connected and the sampler valve opened. After the reading has been taken the canister valve should be closed to check for leaks.

6. The field operator records the canister pressure gauge reading on the sampler after a period of at least 20 minutes from the time the reading in Step 5 is taken.

7. The field operator notes the time in minutes between readings taken in Step 5 and Step 6. If the reading has not changed the canister valve should be opened for the sample run. If a leak is discovered, check connections to canister. If source of leak cannot be found, do not use canister. Set-up another canister for sampling.

8. The field operator records the canister pressure gauge reading at the end of the run.

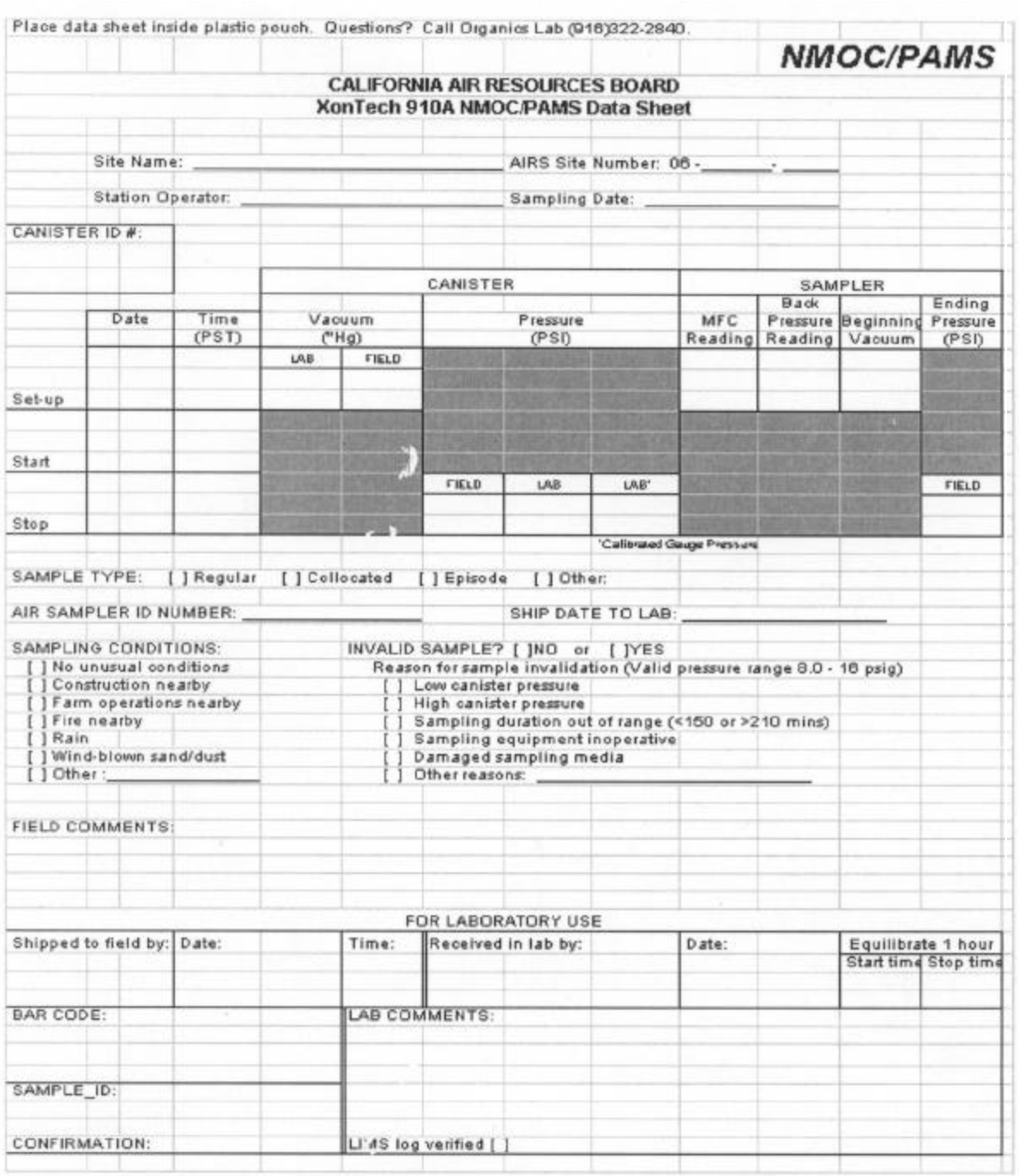
9. The field operator records the sampler pressure reading at the end of the run.

10. The lab staff records the canister pressure gauge reading after the canister is delivered to the lab.

11. The lab staff records the canister pressure reading using the laboratory's calibrated gauge.

MLD-120 (03/96)

Figure Q.1.2.5
Instructions for XonTech 910A Toxics Sampling



Place data sheet inside plastic pouch. Questions? Call Organics Lab (916)322-2840.

NMOC/PAMS

CALIFORNIA AIR RESOURCES BOARD
XonTech 910A NMOC/PAMS Data Sheet

Site Name: _____ AIRS Site Number: 06 - _____ - _____

Station Operator: _____ Sampling Date: _____

CANISTER ID #:

	Date	Time (PST)	CANISTER Vacuum ("Hg) LAB	CANISTER Vacuum ("Hg) FIELD	CANISTER Pressure (PSI) FIELD	CANISTER Pressure (PSI) LAB	CANISTER Pressure (PSI) LAB*	SAMPLER MFC Reading	SAMPLER Back Pressure Reading	SAMPLER Beginning Vacuum	SAMPLER Ending Pressure (PSI) FIELD
Set-up											
Start											
Stop											

*Calibrated Gauge Pressure

SAMPLE TYPE: [ ] Regular [ ] Collocated [ ] Episode [ ] Other:

AIR SAMPLER ID NUMBER: _____ SHIP DATE TO LAB: _____

SAMPLING CONDITIONS:
- [ ] No unusual conditions
- [ ] Construction nearby
- [ ] Farm operations nearby
- [ ] Fire nearby
- [ ] Rain
- [ ] Wind-blown sand/dust
- [ ] Other : _____

INVALID SAMPLE? [ ]NO or [ ]YES
Reason for sample invalidation (Valid pressure range 8.0 - 16 psig)
- [ ] Low canister pressure
- [ ] High canister pressure
- [ ] Sampling duration out of range (<150 or >210 mins)
- [ ] Sampling equipment inoperative
- [ ] Damaged sampling media
- [ ] Other reasons: _____

FIELD COMMENTS:

FOR LABORATORY USE

Shipped to field by:	Date:	Time:	Received in lab by:	Date:	Equilibrate 1 hour Start time	Stop time

BAR CODE:

LAB COMMENTS:

SAMPLE_ID:

CONFIRMATION: LIMS log verified [ ]

Figure Q.1.2.6
XonTech 910A NMOC Datasheet

INSTRUCTIONS FOR XONTECH 910A NMOC SAMPLING

	DATE (PST)	TIME	CANISTER Vacuum ("Hg) Lab	CANISTER Vacuum ("Hg) Field	SAMPLER MFC Reading	SAMPLER Pump Pressure	SAMPLER Set-Up Vacuum	SAMPLER Check Vacuum	SAMPLER Check Minutes
Set-Up			1	2	3	4	5	6	7
Start			Pressure (PSI) Lab	Field					
Stop			10	8				End Pressure (PSI) 9	11

1. The laboratory (lab) staff records the canister vacuum reading before the canister is delivered to the field.

2. The field operator records the canister vacuum gauge reading before the run. The reading recorded by the field operator should be the same as the reading recorded by the lab staff. If it is not the same, the canister has a leak. Do not use the canister. Set-up another canister for sampling.

3. The field **operator records the mass flow controller reading** on the sampler before the run. The flow should be set at about 50 ccm. In case of multiple samples (912 adapter); record the initial reading.

4. The field operator records the back pressure gauge reading on the sampler before the run. The sampler backpressure reading should be set at 20 psi. In case of multiple samples (912 adapter); record the initial reading.

5. The field operator records the canister pressure reading on the sampler after the canister has been connected and the sampler valve opened. After the reading has been taken, the canister valve should be closed to check for leaks.

6. The field operator records the canister pressure gauge reading on the sampler after a period of at least 20 minutes from the time the reading in Step 5 is taken.

7. The field operator notes the time in minutes between readings taken in Step 5 and Step 6. If the reading has not changed the canister valve should be opened for the sample run. If a leak is discovered, check connections to canister. If source of leak cannot be found, do not use canister. Set-up another canister for sampling.

8. The field operator records the canister pressure gauge reading at the end of the run.

9. The field operator records the sampler pressure reading at the end of the run. In case of multiple samples (912 adapter); record the final reading.

10. The lab staff records the canister pressure gauge reading after the canister is delivered to the lab.

11. The lab staff records the canister pressure reading using the laboratory's calibrated gauge.

MLD-122 (03/96)

Figure Q.1.2.7
Instructions for XonTech 910A NMOC Sampling

CALIFORNIA AIR RESOURCES BOARD
MONTHLY QUALITY CONTROL MAINTENANCE CHECK SHEET
XONTECH 910A TOXIC SAMPLER

Station Name: _____ Month/Year: _____

Station Number: _____ Operator: _____

Sampler Property Number: _____ Agency: _____

Date		Can. ID	Start Vac.		910 Flow		Back	Leak	Start	End Press.		Elapsed
Run	Ship	Number	Can.	910A	Meter	Pot.	Pres.	Test	Time	Can.	910A	Runtime

OPERATOR INSTRUCTIONS:

1. Each Run: Check and record the above listed information including the elapsed time meters reading, prior to the run, in the "Start Time" column and the post run reading in the "Elapsed Runtime" column. The figure placed in the "Leak Test" column should be the difference between the initial "910A Start Vac." and the reading 1 hour after reclosing the cannister valve. Any difference and the leak must be repaired prior to the scheduled run.

2. Monthly: Check the maximum pressure of pump by closing the by-pass valve.
Pressure: _____ Date Checked: _____

3. Semi-Annual: Calibrate mass flow meter. Last Cal. Date: _____
Meter reading Slope: _____ Intercept: _____

4. Annually: Replace or clean probe and determine residence time.
Cleaned or Replaced Date: _____ Residence Time: _____

5. As Needed: Return 910 and 912, if used, to Engineering and Laboratory Branch for cleaning and complete check. Date last cleaned: _____

Date	Comments or Maintenance Performed

Reviewed By: _____ Date: _____

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Figure Q.1.2.8
Monthly Quality Control Maintenance Checksheet

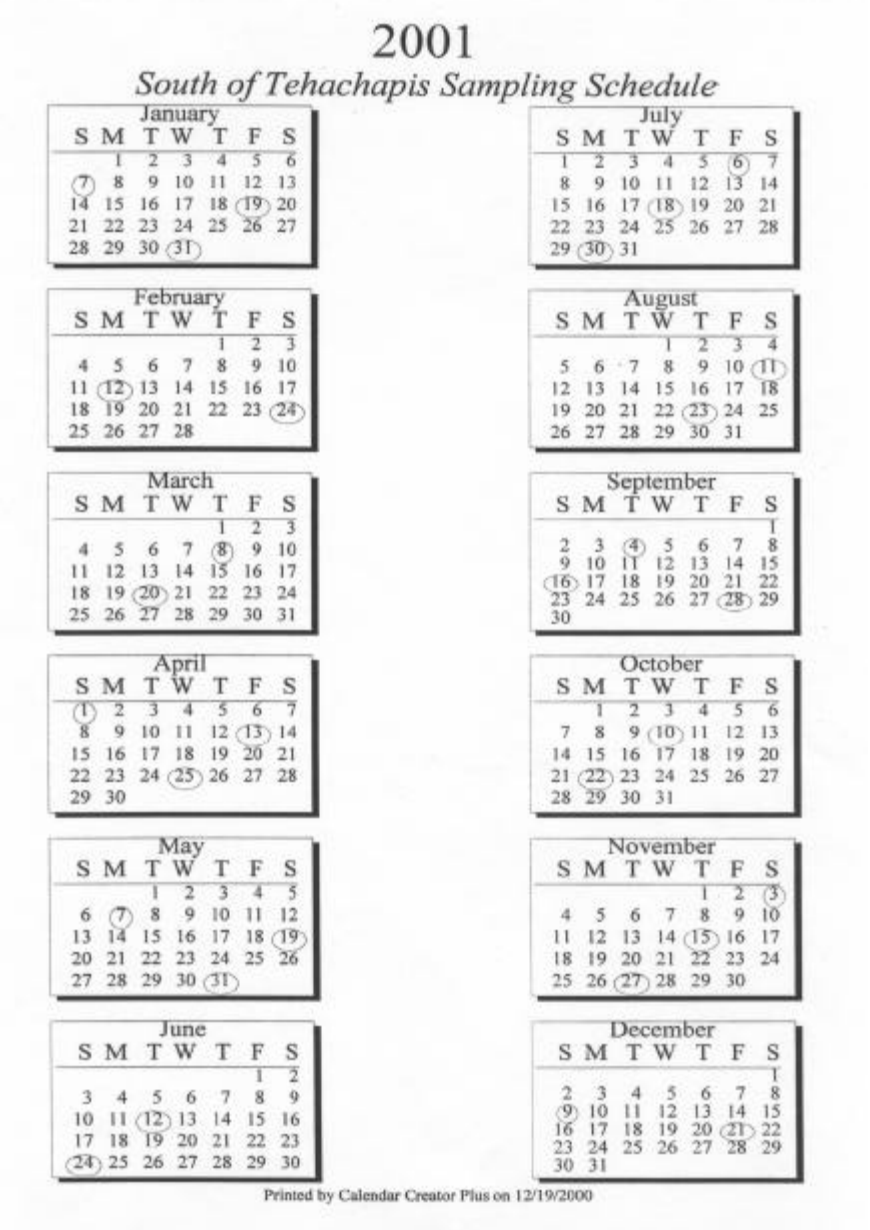

Figure Q.1.2.9
XonTech 910A Sampling Schedule

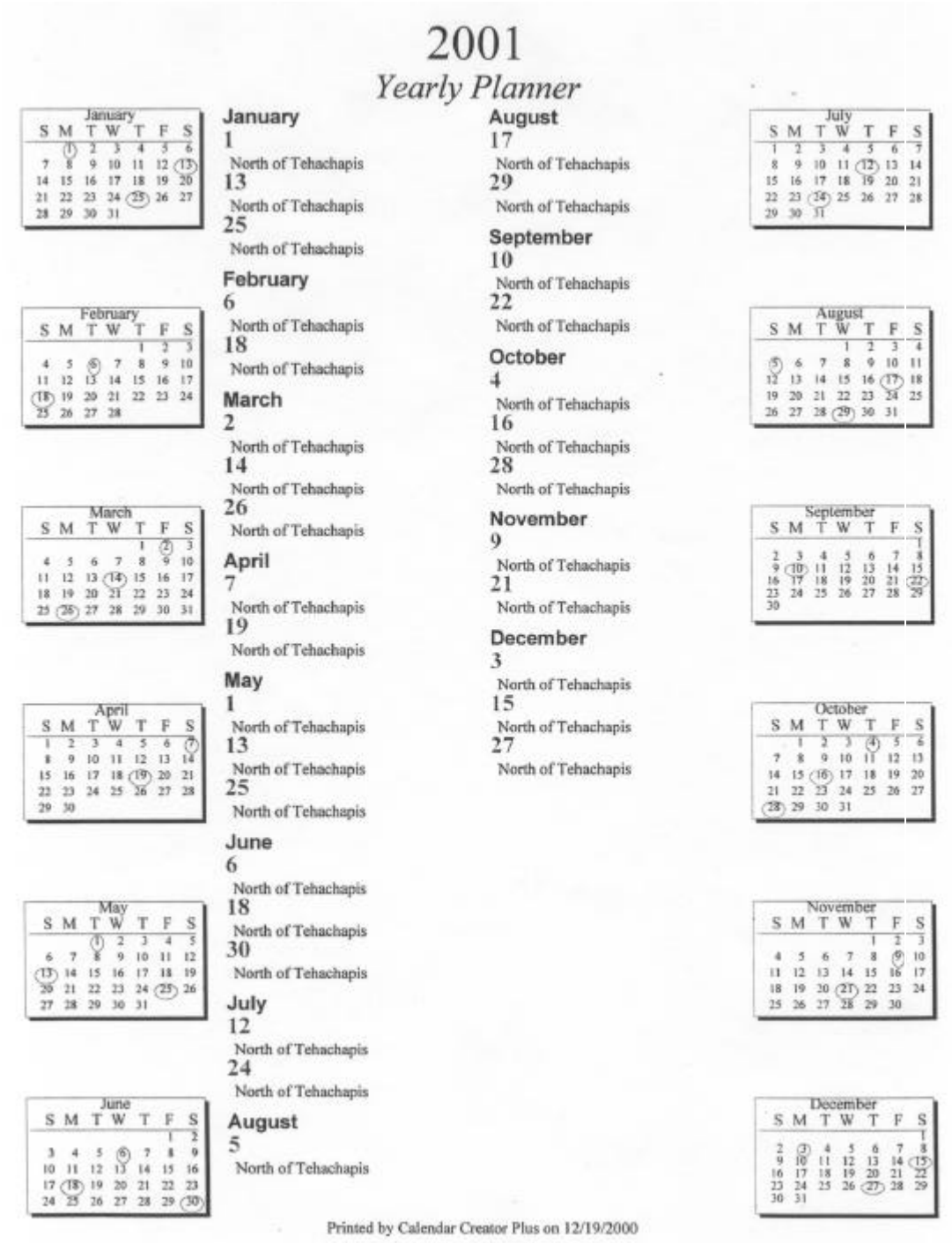

Figure Q.1.2.9
XonTech 910A Sampling Schedule (cont.)

Q.1.3 MAINTENANCE CHECKS

Q.1.3.1 GENERAL INFORMATION

If the operating efficiency of the sampler decreases or a malfunction occurs, the sampler should be returned to the Instrument Laboratory in Sacramento for repair. Perform a leak check (according to the schedule in Table Q.1.3.1) and check each of the operating conditions listed in item "f." of Section Q.1.2.2. Leak checks and flow meter calibration checks may be performed more frequently but should be performed at least at the prescribed intervals.

Q.1.3.2 EACH RUN

Refer to Section Q.1.2.2.

Q.1.3.3 MONTHLY CHECKS

1. Refer to Maintenance Schedule, Table Q.1.3.1.

2. System leak check:

    a. To check for a leak in the sampler, refer to Section Q.1.2.2, step i.

    b. To check for a leak in the sample probe line, cap the probe inlet at the roof. Place a Vol-o-Flow gauge on the exhaust bypass port. If there is no leak, the Vol-o-Flow gauge should go to zero.

3. Pump Pressure Check - Note the position of the adjustment knob and operating pressure reading; turn the pressure set valve V1, clockwise as far as it will go and read the maximum pressure of the pump at pressure gauge G1 (see Figure Q.1.2.1). The pressure reading should be a minimum of 20 psig. Return the valve to the original set point (pressure setting affects probe flow rate).

Q.1.3.4 SEMI-ANNUAL CHECK

Perform mass flow meter calibration check.

Q.1.3.5 ANNUAL MAINTENANCE

1. Replace sampling probe.

2. Check residence time.

Table Q.1.3.1
Maintenance Schedule for the XonTech Model 910A Sampler

Perform sampler leak checks	**Month**	**X Each Sample**	**Semi-Annual**	**As Directed**
Check maximum pressure of pump with by-pass valve closed	**X**			
Perform mass flow meter calibration check			**X**	
Return to Northern Laboratory Branch, Sacramento for cleaning and complete check				**X**
Probe replacement Check residence time			**X**	

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VOLUME II
STANDARD OPERATING PROCEDURES
FOR
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APPENDIX Q.2
CALIBRATION PROCEDURES
FOR
XONTECH MODEL 910A SAMPLER

MONITORING AND LABORATORY DIVISION

MARCH 1996

Q.2.0 CALIBRATION PROCEDURES

Flow calibration is performed in the laboratory in accordance with Section Q.2.1.1 and a sticker is affixed to the sampler to denote the required flow set point, which is altitude dependent. Flow calibration is also performed in the field. Prior to each run, the operator checks the flow rate display and the duo-dial potentiometer to verify that they are at the specified set point. If it is not at this set point, the operator is to readjust the Flow Controller (duo-dial potentiometer, ref. Section Q.1.2.2) and contact the appropriate ARB Air Monitoring Section.

The XonTech Model 910A gaseous sampler uses a mass flow controller. The following procedures cover laboratory calibration at six-month intervals.

Q.2.1 OVERVIEW

Q.2.1.1 LABORATORY AND FIELD CALIBRATION

1. Flow Rate Calibration Apparatus

   a. Calibrated 0-100 SCCM airflow transfer standard (mass flow meter) or 0-10 SCCM magnehelic gage.

   b. One-quarter inch Teflon tubing as needed for connections and Swagelock connectors as needed.

   c. Laboratory or field log book.

2. Determine the flow rate set point by using the following procedure.

   The sampler flow rate required to properly filling a SUMMA canister is approximately 7.6 CCM for Toxics and 60 CCM for NMOC. Calculate the standard flow rate (SCCM), which is altitude dependent that corresponds to 7.6 CCM or 60 CCM, using one of the following equations and record the calculated reading in the logbook.

   SCCM = 7.6 CCM/ACF for 24 hour Canister sample SCCM = 60 CCM/ACF for 3 hour Canister sample Where ACF = Altitude Correction Factor at Site Elevation

   (Ref: Table A.3.0.1 in QA Manual, Volume II, or equation)

   ACF = .999 x Exp. (.0000371 x Altitude, ft.)

3. Convert the SCCM to a digital reading using the transfer standard's calibration equation. Record this digital reading in the logbook.

4. Disconnect the sample inlet probe line from its sample port and cap the Teflon inlet line (applicable in field).

5. Attach a 0-100 SCCM air flow transfer standard (mass flow-meter) or 0-10 SCCM magnehelic gauge to the sampler outlet port.

6. Turn on the sampler.

7. After 30-minute purge period, adjust the sampler flow using the Flow Adjust Controller (duo-dial potentiometer) so the transfer standard flow meter display indicates the digital reading calculated in step 3 above.

8. After the transfer standard has stabilized, record the front panel digital reading in the logbook. Affix a sticker denoting this reading on the front panel.

9. The Engineering and Laboratory Branch performs "As Is" Laboratory Analysis - Pass Grade 5 nitrogen (that has gone through a methanator) into the sampler at 60 CCM for 30 minutes and then into a gas chromatograph. The analysis results must meet the following specifications for cleanliness. If the sampler does not meet this criterion, the Organic Laboratory Section (OLS) shall purge the sampler in their oven at 50°C overnight and perform another analysis.

CRITERIA LEVEL FOR CLEAN AIR SAMPLERS

Clean Air Sampler

Contaminant	Criteria Level (ppb)
Benzene	<0.5
Carbon Tetrachloride	<0.02
Chloroform	<0.02
1,1,1-Trichloroethane	<0.1
Dichloromethane	<1.0
Perchloroethylene	<0.07
Trichloroethylene	<0.02

a. If the sampler meets the above cleanliness criteria, OLS shall place a sticker of certification on the sampler.

b. If the sampler does not meet cleanliness criteria after the overnight nitrogen purge, it will be sent to the Instrumentation and Operations Support Section (IOS) for thorough disassembly and cleaning per IOS standard procedure, and a repeat analysis by OLS.

10. After meeting the sampler's cleanliness criteria, perform the following field checks.

a. Timer Calibration - Check against an elapsed time meter. If not within $\pm$ 15 minutes/24 hours, adjust and repeat the test.

b. Elapsed Time Meter - Check against a standard time piece of known accuracy. If not within $\pm$ 2 minutes/24 hours adjust or replace.