Quality Assurance Project Plan

Longview Air Toxics Monitoring Project

Draft

October 21, 2004

QA Project Plan Identification and Approval

Title: Longview Air Toxics Monitoring Project Quality Assurance Project Plan for the Southwest Clean Air Agency (SWCAA).

The Longview Air Toxics Monitoring Project Quality Assurance Project Plan for SWCAA is hereby recommended for approval and commits the agency to follow the elements described within.

SWCAA

_____ Date: _____
Robert D. Elliott, Executive Director

_____ Date: _____
Randy Peltier, Operations Manager

EPA Region 10

_____ Date: _____
Keith Rose, Air Program Oversight Manager

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1. DISTRIBUTION

A copy of this Air Toxics Monitoring Quality Assurance Project Plan is distributed to the following listed below:

Laurie Hulse-Moyer, Site Operator
Southwest Clean Air Agency

Natalia Kreitzer, Project Support/Backup Operator
Southwest Clean Air Agency

Randy Peltier, Project Manager
Southwest Clean Air Agency

Bob Jones, Laboratory Project Manager
Oregon Department of Environmental Quality

Keith Rose, Regional Project Officer
USEPA Region 10

2. PROJECT/TASK ORGANIZATION

The title and responsibilities of key personnel and the agencies involved are:

Southwest Clean Air Agency (SWCAA):
SWCAA is the EPA 105 grant recipient and lead agency for this air toxics monitoring project. SWCAA staff is responsible for establishing and operating the monitoring site, transporting samples to and from the ODEQ Lab, maintaining field notebooks and data records, and project management. SWCAA key project staff are:

Laurie Hulse-Moyer, Air Quality Scientist
Site operation including sample set-up/collection/recovery, field data collection, equipment calibration, routine maintenance and repair.

Natalia Kreitzer, Air Quality Engineer
Site installation, sample transport to/from Oregon Department of Environmental Quality Lab, project support, backup site operation.

Randy Peltier, Operations Manager
Project Manager for the Longview Air Toxics Monitoring Project.

Oregon Department of Environmental Quality Laboratory:
The Oregon Department of Environmental Quality (ODEQ) Laboratory is responsible for sample preparation and analysis, data reduction and reporting. The ODEQ Laboratory has an air toxics Quality Assurance Project Plan (QAPP) for the associated work that is

on file at EPA Region 10. This QAPP will be referenced throughout this document as *The ODEQ Air Toxics QAPP*. ODEQ key project staff are:

Paul McKay,
ODEQ Lab Quality Assurance Officer
Bob Jones,
ODEQ Lab Project Manager
Holly Stewart,
Sample preparation and receipt, primary operator contact/liaison with ODEQ Lab.

Washington Department of Ecology:
The Washington Department of Ecology (WDOE) has loaned all of the sampling equipment to SWCAA for this project, including the associated calibration standards. WDOE has also provided operator training and technical support as required. WDOE key project staff are:

Doug Knowlton, Air Monitoring Specialist, NWRO
Secure field monitoring equipment, provide operator training and field technical support.

3. PROBLEM DEFINITION AND BACKGROUND

The Southwest Clean Air Agency (SWCAA) is concerned about the public's exposure to air toxics emissions from area, point, and mobile sources. One area of concern within SWCAA's jurisdiction is the Longview/Kelso area in Cowlitz County. This area is highly industrial with several pulp and paper mills, and several power plants under construction. Cowlitz County ranks highest in the state for air releases of total toxic chemicals and recognized carcinogens based on Toxic Release Inventory (TRI) data. In addition, a high volume of diesel traffic serves the area. No previous ambient toxics monitoring has been performed in the Longview/Kelso area.

The purpose of this study is to supplement the data developed from the national ambient HAP monitoring network in the Northwest by performing ambient monitoring at a previously disregarded area, the Longview/Kelso area. The data will be used to assess relative exposure of the Longview/Kelso residents to HAPs by comparing the measured concentrations to those typical of other urban areas and to those estimated by NATA modeling.

4. PROJECT/TASK DESCRIPTION

The measurement goal of this monitoring project is to estimate the concentration, in units of micrograms per cubic meter ($\mu g/m^3$) and parts per billion/volume (ppbv) of particulate and gas phase air toxic compounds in the ambient air in the Longview/Kelso area. This will be accomplished by using four separate sampling/analytical methods:

- Toxic metals will be measured by Compendium Methods IO-2.1/IO-3.1/IO-3.5 using high volume sampling of particulate matter smaller than 10 microns in diameter (PM_{10}) onto 8" x 10" quartz glass filters.
- Volatile organic compounds (VOCs) will be measured by EPA Compendium Method TO-15 using passivated stainless steel (SUMMA) canisters;
- Carbonyls (i.e., aldehydes and ketones) will be measured by Compendium Method TO-11A using dinitrophenylhydrazine (DNPH) coated solid sorbent cartridges;
- Semi-volatile organic compounds (SVOCs) will be measured by Compendium Method TO-13A using polyurethane foam (PUF) cartridges with a 4" quartz glass filter.

Field Activities

Tables 4.1, 4.2, 4.3 and 4.4 summarize some of the critical performance requirements for the field sampling activities.

Table 4.1 Design/Performance Specifications - PM_{10} Hi Vol - Toxic Metals

Equipment	Frequency	Acceptance Criteria	Reference
Filter Design Specs. Size Medium Filter thickness Collection efficiency Stability Temperature	1 in 6 days	See Reference 1 8.5" x 11" Quartz Glass Fiber Filter 0.50 mm 99.95% temperatures > 540°C	See Reference 1 "IO-2.1 Sec 8.1 " Sec 3.2 "Sec 6.2.4 "Sec 6.2.2 "Sec 6.2.2
Sampler Performance Specs. Sample Flow Rate Flow Regulation Flow Rate Precision Flow Rate Accuracy Clock/Timer	1 in 6 days	 1.13 m^3/min. 0.1 m^3/min. $\pm$7% $\pm$7% 24 hour $\pm$ 2 min accuracy	 "Sec 6.1.4 " Reference 5, Appendix J Reference 6 Section 2.11.7 Reference 7, Section 2.11.2

Table 4.2 Design/Performance Specifications - Air Canister Sampler - Volatile Organic Compounds

Equipment	Frequency	Acceptance Criteria	Reference
Canister Design Specs.	1 in 6 days	See Reference 2	See Reference 2
Size		6 liters spherical	"Vender Spec.
Medium		Passivated SUMMA electro-polished Stainless Steel Canister	"
Max Pressure		30 psig	"
Max. pressure drop		14 psig.	"
Collection efficiency		99%	"
Lower Detection Limit		compound specific, usually >0.1 ppbv	See TO-15
Sampler Performance Specs.	1 in 6 days		
Sample Flow Rate		180 cc/min.	"Vender Spec.
Flow Regulation		1.0 cc/min.	See Reference 2
Flow Rate Precision		±10%	TO-15
Flow Rate Accuracy		±10%	"
External Leakage		Vendor specs	NA
Internal Leakage		Vendor specs	NA
		24 hour ± 2 min accuracy	"Sec 6.1.8

Table 4.3 Design/Performance Specifications - Carbonyl Sampler - Aldehyde and Ketone Compounds

Equipment	Frequency	Acceptance Criteria	Reference
Filter Design Specs.	1 in 6 days	See Reference 3	See Reference 3
Size, Medium		2-5 in. Cylindrical Silica Gel cartridge coated with 2,4-Dinitro-phenyl hydrazine	"TO-11A Sec 7
			"
			"
Sampler Performance Specs.	1 in 6 days		
Sample Flow Rate		1.0 l/min.	"Vender Spec.
Flow Regulation		0.02 l/min.	"
Flow Rate Precision		±10%	"
Flow Rate Accuracy		±10%	"
Clock/Timer		24 hour ± 2 min accuracy	"Vender Spec.

Table 4.4 Design/Performance Specifications – PUF sampler – Semi-Volatile Organic Compounds

Equipment	Frequency	Acceptance Criteria	Reference
Filter Design Specs.	1 in 6 days	See Reference 4	See Reference 4
Size		4 in. dia. Quartz Glass Fiber Filter with	"TO-13A
			"
Medium		3 in. lng. Polyurethane Foam Cartridge	"
Sampler Performance Specs.	1 in 6 days		
Sample Flow Rate		226 l/min.	Reference 4
Flow Regulation		20 l/min.	"
Flow Rate Precision		±10%	"
Flow Rate Accuracy		±10%	"
Clock/Timer		24 hour ± 2 min accuracy	"Vender Spec.

All of the instruments operated in the field are vendor supplied. The descriptions of the samplers are similar to the instruments described in the references noted above.

Laboratory Activities

All laboratory activities in support of this monitoring project will be conducted by the ODEQ Lab located on the Portland State University campus in Portland, Oregon. These activities include all sample preparation, sample analysis, data reduction, reporting and the associated quality assurance and quality control activities. Refer to *The ODEQ Air Toxics QAPP* for more information on laboratory activities.

Schedule of Activities

Table 4.5 contains a list of activities required to complete the Project.

Table 4.5 Schedule of Activities

Activity	Schedule
Sampler Acquisition	Complete - February 2004
Site Selection and Permits	Complete - March 2004
Personnel/Training	Ongoing - Since February 2004
QAPP Development	Submitted for Review - October 2004
Site Installation	Complete - May 2004
Routine Sampling	Ongoing - Since May 2004; 1 Year Term @ 1/6 days
Sample Analysis	Ongoing
Data Reduction	Ongoing
AQS Submittals	90 days after the quarter in which samples were collected
Final Report	September 2005

References

1. Compendium of Methods for the Determination of Inorganic Compounds in Air, United States Environmental Protection Agency, June 1999, Section IO-2.1.
2. Compendium of Methods for the Determination of Toxic Organic Compounds in Air, United States Environmental Protection Agency, January 1999, Section TO-15.
3. Compendium of Methods for the Determination of Toxic Organic Compounds in Air, United States Environmental Protection Agency, January 1999, Section TO-11A.
4. Compendium of Methods for the Determination of Toxic Organic Compounds in Air, United States Environmental Protection Agency, January 1999, Section TO-13A.
5. Code of Federal Regulations, Chapter 40, Part 50, Appendix J, Section 4.1.
6. Quality Assurance Handbook for Air Pollution Measurement Systems Volume II, Section 2.11.7, April 1989.
7. Quality Assurance Handbook for Air Pollution Measurement Systems Volume II, Section 2.11.2, April 1989.

5. DATA QUALITY OBJECTIVES AND CRITERIA

Data quality objectives for this monitoring project will be consistent with those of ODEQ as described in *The ODEQ Air Toxics QAPP*.

6. TRAINING

Training on the operation, maintenance, calibration, and data gathering/reduction for the field sampling equipment was provided to SWCAA staff by Doug Knowlton with the Washington Department of Ecology. Training on sample handling, transport and custody was provided by ODEQ Laboratory staff.

7. DOCUMENTATION AND RECORDING

Current versions of this Quality Assurance Project Plan will be provided to those on the distribution list (Section 1) in electronic format. Revisions will be made as required by SWCAA and distributed accordingly.

All field data records will be maintained by SWCAA as electronic format in a dedicated project folder on the SWCAA server and/or as hardcopy format in a field notebook. These records include field data sheets, flow calculation spreadsheets, flow and leak check records, calibration records, downloaded meteorological data and associated operator notes.

The site operator will maintain a site logbook documenting operational and maintenance activities at this monitoring site. The logbook entries will be identified with the date, time, operator, instrument, parameter, and units as appropriate for each documented activity. The logbook will be used to document quality control checks, maintenance, audits, equipment changes and missing or invalid data.

Standard operating procedures and operator manuals for the field sampling equipment will be maintained in a procedures notebook by SWCAA.

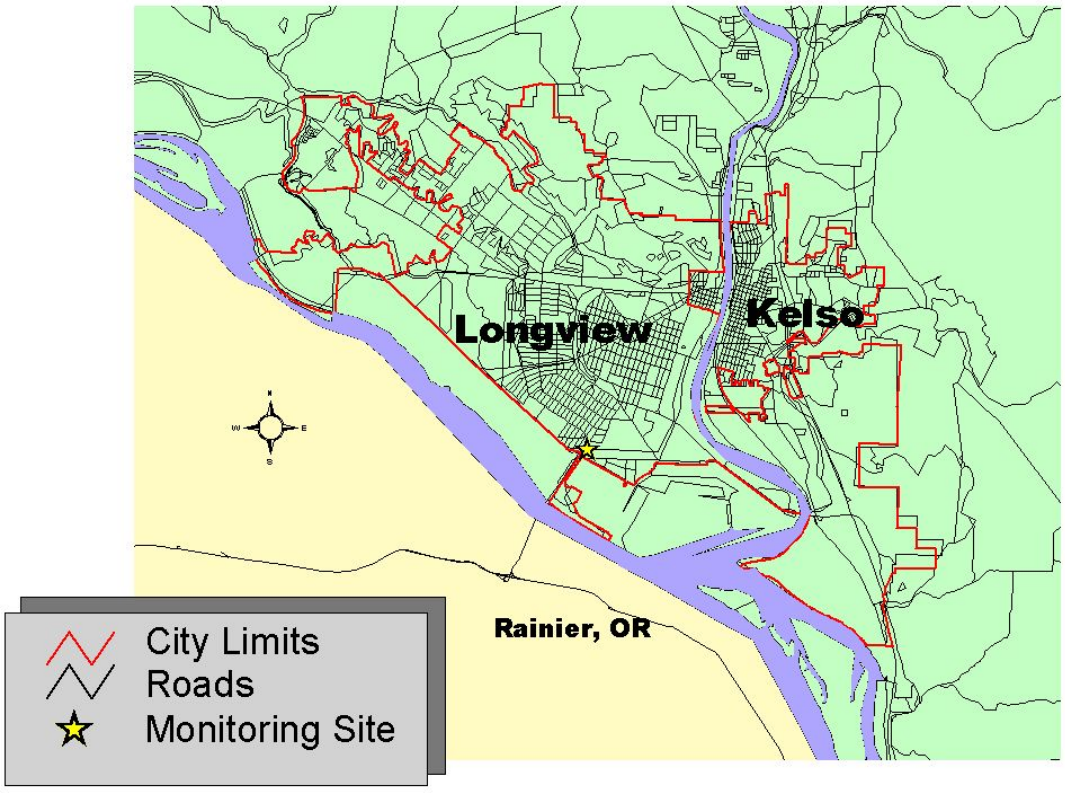
A hardcopy of the field data sheet and flow calculation sheet, as appropriate, will be returned with each sample to the ODEQ Lab. The ODEQ Lab will combine this field data with analytical results for the respective samples to determine the ambient concentration for each analyte in units of $\mu g/m^3$ or ppbv. Records of these results and all of the laboratory documentation associated with the preparation, analysis and data reduction of the respective samples will be maintained by the ODEQ Lab according to *The ODEQ Air Toxics QAPP*.

The ODEQ Lab will prepare preliminary reports of the ambient concentration results with the associated sampling parameters and submit them to SWCAA quarterly in electronic format. ODEQ will also format and report the results into the AIRS/AQS database within 90 days of the end of the calendar quarter in which the monitoring was done.

8. SAMPLING PROCESS DESIGN

A single monitoring site was established in the Longview area and will be operated for one year, beginning in May 2004. The site is located at 254 Oregon Way, in Longview, Washington. The location is proximate to commercial businesses to the east and residential neighborhoods to the west. It is not located adjacent to any industrial facility, however, it is located between the two pulp mills, near residential wood stove use and in the vicinity of major heavy truck traffic routes. This site was chosen to represent ambient concentrations that a residential population may be exposed to from a variety of sources within the Longview/Kelso area. This site was previously used for TSP then PM_{10} monitoring from 1978 into early 2001. Accordingly an AIRS number was established for this site; 53-015-0006. A map showing the monitoring site location is included as Figure 8.1.

Table 8.1 Longview Toxics Monitoring Site Location



Integrated 24-hour samples will be collected on the EPA established one-in-six-day monitoring schedule as summarized below:

- Toxic metals will be measured by Compendium Methods IO-2.1/IO-3.1/IO-3.5 using high volume sampling of particulate matter smaller than 10 microns in diameter (PM_{10}) onto 8" x 10" quartz glass filters;
- Volatile organic compounds (VOCs) will be measured by EPA Compendium Method TO-15 using passivated stainless steel (SUMMA) canisters;
- Carbonyls (i.e., aldehydes and ketones) will be measured by Compendium Method TO-11A using dinitrophenylhydrazine (DNPH) coated solid sorbent cartridges;
- Semi-volatile organic compounds (SVOCs) will be measured by Compendium Method TO-13A using polyurethane foam (PUF) cartridges with a 4" quartz glass filter.

Field sampling and sample transport will be conducted by SWCAA. Sample preparation and analysis will be performed by the ODEQ Lab. Accordingly, the analytes, methods and results will be comparable to those obtained in Vancouver, WA during the 2001 Portland/Vancouver air toxics monitoring study conducted by ODEQ in cooperation with SWCAA. The product of these sampling and analytical efforts will be the 24-hour average ambient concentration in units of $\mu g/m^3$ or ppbv of each analyte for each sample day over the one year term of the project. The target analytes for each of the above methods are shown in Table 8.1.

Table 8.1 List of Hazardous Air Pollutants to be Measured

EPA Method	Toxics On Integrated Urban Air Toxics Strategy List	Additional HAP
TO-15	Benzene[*]	Methyl Chloride
	1,3-Butadiene*	Methyl Bromide
	Carbon Tetrachloride*	Ethyl Chloride
	Chloroform*	1,1-Dichloroethene
	1,2-Dichloropropane*	1,1-Dichloroethane
	Methylene Chloride*	1,1,1-Trichloroethane
	Tetrachloroethene*	1,1,2-Trichloroethane
	Trichloroethene*	Toluene
	Vinyl Chloride	Chlorobenzene
	Acrylonitrile	Ethylbenzene
	1,2 Dibromoethane	m-Xylene
	cis-1,3-Dichloropropene	p-Xylene
	Trans-1,3-Dichloropropene	Styrene

EPA Method	Toxics On Integrated Urban Air Toxics Strategy List	Additional HAP
	1,2-Dichloroethane	o-Xylene
	1,1,2,2-Tetrachloroethane	1,4-Dichlorobenzene
		1,2,4-Trichlorobenzene
		Hexachloro-1,3-Butadiene
IO-3	Arsenic	Antimony
	Beryllium*	Cobalt
	Cadmium*	Selenium
	Chromium*	Chromium Vi
	Lead*	
	Manganese*	
	Nickel*	
TO-11A	Acetaldehyde*	Propionaldehyde
	Formaldehyde*	Methyl Ethyl Ketone
TO-13A		Benzo(B)Fluoranthene[†]
		Benzo(A)Pyrene†
		Dibenzo(A,H) Anthracene†
		Indeno(1,2,3 C,D)Pyrene†
		Chrysene†
		Benz(A)Anthracene†
		Naphthalene†

* Core Pollutants identified by National Monitoring Network Steering Committee

† Considered part of the 7-PAH group of HAP

9. SAMPLING METHODS

The following sampling methods will be utilized for measuring the toxic air pollutants described above:

- Toxic metals will be sampled according to the Compendium Method IO-2.1 using high volume sampling of particulate matter smaller than 10 microns in diameter

(PM_{10}) onto 8" x 10" quartz glass filters. Ambient air is sampled at a target flow rate of 1.13 cubic meters per minute (m^3/min) through a PM_{10} inlet that removes particles larger than 10 microns in diameter (aerodynamic) from the air stream. The remaining PM_{10} particles are then deposited on the filter for subsequent laboratory analysis.

- Volatile organic compounds (VOCs) will be sampled according to the Compendium Method TO-15 using passivated stainless steel (SUMMA) canisters. Ambient air is drawn into a 6 liter evacuated canister through a pump and metering apparatus at a target flow rate of 7-8 liters per minute (l/min) to achieve a positive pressure of 8 pounds per square inch (psi) or greater in the canister by the end of the sampling period. The pressurized canister is then sealed and returned to the laboratory for subsequent analysis.
- Carbonyls (i.e. aldehydes and ketones) will be sampled according to Compendium Method TO-11A using dinitrophenylhydrazine (DNPH) coated solid sorbent cartridges. Ambient air is drawn through the prepackaged sorbent cartridges at a target flow rate of 1.0 l/min. The exposed cartridge is then sealed and returned to the laboratory for subsequent analysis.

  Exception - Compendium Method TO-11A recommends the use of an ozone denuder to remove ambient ozone from the sample stream ahead of the DNPH cartridge to minimize potential interferences. The sampling equipment for this project is on loan from the WDOE and the WDOE does not use denuders for carbonyl sampling. Therefore, the carbonyl samples for this project will be collected without the use of an ozone denuder.
- Semi-volatile organic compounds (SVOCs) will be sampled according to Compendium Method TO-13A using polyurethane foam (PUF) cartridges with an integral 4" quartz glass filter. Ambient air is drawn through the prepackaged PUF cartridges at a target flow rate of 226 l/min. The sampled air stream first passes through the filter where particulate matter is deposited then through the PUF material where the vapor phase SVOCs are adsorbed. The exposed cartridge is then capped and returned to the laboratory for subsequent analysis.

Sampling for all pollutants is performed on a once every six day schedule to correlate with EPA's Monitoring Schedule. The sampling schedule is consistent with the one-in-six timing relative to the EPA's published Monitoring Schedule. All samples are 24-hr integrated samples and the sampling periods are from midnight-to-midnight on each sampling day. This will yield about 61 sampling days over the one year term of the project.

No meteorological instruments are being operated by SWCAA at the monitoring site, so meteorological data from the Longview/Kelso airport will be used to support this project. The site operator will download meteorological data for each sample set-up, collection, and recovery day. The data will be retained electronically in a dedicated folder on the SWCAA server and as hardcopies in the field notebook.

Sample Preparation

Sample medium preparation involves the following:

- PM_{10} filter receipt, inspection, numbering, conditioning, weighing and storage;
- VOC clean-up, certification and storage;
- Carbonyl cartridge certification and handling;
- PUF cartridge clean-up, certification and handling.

The ODEQ Lab will prepare all of the samples for this project prior to turning them over to SWCAA for field set-up and sampling. Refer to *The ODEQ Air Toxics QAPP* for more information on laboratory activities.

Sample Set-up

The SWCAA field staff is responsible for sample set-up, sample collection, and sample recovery. SWCAA will ensure that the appropriate equipment and technical assistance are provided to the air toxics monitoring site operators with the installation. The site operators will use the following procedures:

- High Volume PM_{10} Volumetric Flow Controlled Procedure (WDOE SOP);
- Volatile Organic Compound Sampling Procedure (WDOE SOP);
- Carbonyl Compounds Air Sampling Procedures (WDOE SOP with a modified sampling rate);
- PUF Polyurethane Foam High Volume Sampler (Vendor Operations Manual).

Sampling Corrective Actions

Corrective actions will be taken as described in Table 9.1 below in response to any problems that may occur with the field sampling equipment. SWCAA field monitoring staff will be responsible for promptly correcting any problems encountered with the field sampling equipment. Assistance will be solicited from WDOE or ODEQ field staff if necessary.

Table 9.1 - Field Sampling Equipment Corrective Actions

Item	Problem	Action
Erratic Flow Rates	Motor near failure	Document in field notebook; replace or repair; flag data
PM_{10} Sample Flow Rate >$\pm$ 10%	Leak in sampling train/out of calibration	Document in field notebook; repair/recalibrate; flag data
Leak Test Failure	System won't hold pressure or vacuum	Document in field notebook; inspect connections; flag data
Carbonyl Sample Flow Rate >$\pm$ 10%	Leak in sampling train/out of calibration	Document in field notebook; repair/recalibrate; flag data
PUF Sample Flow Rate >$\pm$ 10%	Leak in sampling train/out of calibration	Document in field notebook; repair/recalibrate; flag data
Elapsed Time >$\pm$ 10 min/day	Check programming; verify if power outage	Document in field notebook; notify lab; reprogram; flag data
Elapsed Time; sample didn't run	Check programming	Document in field notebook; reprogram

10. SAMPLE HANDLING AND CUSTODY

ODEQ field data forms will be completed for each sample. One copy of the forms will be kept in a field notebook at SWCAA and one copy will be sent to the lab with the samples. Copies of the field data forms are shown in Figures 10.1, 10.2 and 10.3. The samples will be collected by the SWCAA site operator on the next day after each sampling day if possible, but not later than the third day. The carbonyl and PUF sample cartridges will be capped immediately upon removal from the sampler and placed in a cooler with "blue ice" for transport back to the SWCAA office in Vancouver, WA. At the SWCAA office the samples will be transferred temporarily into a refrigerator dedicated exclusively for sample storage. Samples will then be delivered in a cooler with "blue ice" to the ODEQ Lab within five days of sample collection. The sample medium storage temperatures and holding times will be as specified in Compendium Methods IO-2.1/IO-3.1/IO-3.5, TO-15, TO-11A and TO-13A.

Figure 10.1

DEPARTMENT OF ENVIRONMENTAL QUALITY LABORATORY
Air Quality Monitoring

HAPS CANISTER SAMPLING DATA

1ST CANISTER

SITE WLO – Longview City Shops DATE_____

SITE # 31472 OPERATOR_____

SINGLE CANISTER_____ ELAPSED TIME_____

CANISTER #_____ MASS FLOW METER #_____

START VACUUM_____ FLOW (cc/min) _____

FINAL PRESSURE_____ LEAK CHECK_____

% Duty Cycle: _____

2ND CANISTER

OPERATOR_____ ELAPSED TIME_____

CANISTER # _____ MASS FLOW METER #_____

START VACUUM_____ FLOW (cc/min) _____

FINAL PRESSURE _____ LEAK CHECK_____

% Duty Cycle: _____

COMMENTS: (unusual weather conditions, circumstances that might affect samples, etc.)

_____
_____
_____
_____
_____
_____
_____
_____
_____

Revised 10/03

Figure 10.2

Southwest Clean Air Agency

ALDEHYDE
HAPS SAMPLER FIELD DATA FORM

Cartridge Number:_____Collector:_____

Sample Location:_____SiteNumber:_____

Sample Cartridge is set up on Channel: A B C Leak Check _____

Total Elapsed Time: _ _ . _ _ Hrs.
Total Elapsed Time: _ _ _ _ _ _ . __ min.

Channel: A B C Ave. Flow Rate Indicated :_____

Cal. Corrected True Flow _____lpm

Ave. Bp:_____ "Hg Ave. Temp. $_{amb}$:_____^{o}F = _____^{o}C

Corr. Factor { [(T_{amb} ^{o}C) +273.16] / (Bp "Hg)} x .10035 = _____

Average True Flow rate During Sampling:_____lpm **[LTP]**

Time and Date Cartridge Installed: _____, ____/____/_____
Time and Date Sampling Started: _____, ____/____/_____
Time and Date Sampling Stopped: _____, ____/____/_____
Time and Date Cartridge Removed:_____, ____/____/_____

Aldehyde Sampler Number: _____
PM10 HV Sample Number: _____

Comments:_____

_____

_____

_____

_____

_____

_____

Figure 10.3

PUF
HAP SAMPLER FIELD DATA FORM

Sample Number:_____ Collector:_____

Sample Location:_____ __ Site Number:_____

Initial Elapsed Timer Reading: _ _ _ _ _ _.__
Final Elapsed Timer Reading: _ _ _ _ _ _.__
==========
Total Elapsed Time: _ _ _ _ _ _.__ min.

Start Flow T_{amb} _____ Bp _____
Magnehelic Gauge Reading: _____" H_2O
Leak Check _____

Corrected True Start Flow Rate: _____cfm

Stop Flow T_{amb} _____ Bp _____

Magnehelic Gauge Reading: _____"H_2O

Corrected True Stop Flow Rate: _____cfm

Time and Date Cartridge Installed: _____, ____/____/____
Time and Date Sampling Started: _____, ____/____/____
Time and Date Sampling Stopped: _____, ____/____/____
Time and Date Cartridge Removed: _____, ____/____/____

EPA/DOE Sampler Number: _____
Average Temperature _____ Average Barometric Pressure _____

Average True Flow Rate During Sampling : _____cfm [L.T.P.]

Comments:_____
_____
_____
_____
_____
_____
DEQ Lab, 1999

11. ANALYTICAL METHODS

Laboratory analysis of all samples will be performed by the ODEQ laboratory according to the following methods.

- Toxic metals will be analyzed according to EPA Compendium Methods IO-3.1/IO-3.5 using the high volume samples of particulate matter smaller than 10 microns in diameter (PM_{10}) on 8" x 10" quartz glass filters;
- Volatile organic compounds (VOCs) will be analyzed according to EPA Compendium Method TO-15 using the passivated stainless steel (SUMMA) canister samples;
- Carbonyls (i.e., aldehydes and ketones) will be analyzed according to EPA Compendium Method TO-11A using the dinitrophenylhydrazine (DNPH) coated solid sorbent cartridge samples;
- Semi-volatile organic compounds (SVOCs) will be analyzed according to EPA Compendium Method TO-13A using the polyurethane foam (PUF) cartridge and 4" quartz glass filter samples.

Approximately 61 routine samples for each of the above analyte groups (PM_{10} toxic metals, VOC, carbonyls, SVOC) will be analyzed over the one year term of this project. Blank and duplicate samples analyzed for quality assurance purposes will be additional to these quantities.

12. QUALITY CONTROL REQUIREMENTS

The quality control procedures specified in 40 CFR 58, Appendix A and EPA's Quality Assurance Handbook for Air Pollution Measurement Systems, Volumes II and IV will be utilized to check the quality of the data. The frequencies, control limits, and corrective actions associated with the field equipment are presented in Table 12.1.

Table 12.1 Quality Control Checks for Field Equipment

Parameter	Check	Control Limit	Corrective Action
Manual Method PM_{10}	**Monthly** Flow Check	 > ±7% > ±10%	 Re-calibrate Rectify Problem, Re-calibrate, Flag Data
VOC (Xontech)	**Weekly** Leak Check	 Leak indicated	 Rectify Problem, Flag Data
Carbonyl (Xontech)	**Quarterly** Flow/Leak Check **Weekly** Leak Check	 > ±10% Leak indicated	 Rectify Problem, Flag Data Rectify Problem, Flag Data
SVOC (Tisch PUF)	**Monthly** Flow Check **Weekly** Leak Check	 > ±10% Leak indicated	 Rectify Problem, Re-calibrate, Flag Data. Rectify Problem, Flag Data

Quality control activities associated with the field equipment will be documented in the field notebook.

Duplicate and blank samples will be collected according to the schedule shown in Table 12.2. It is not possible to collect duplicate samples for the PM (metals) and the SVOC samples because co-located samplers would be required and were not available for this project. Duplicate samples will be run monthly for carbonyls and VOCs. Field blanks will be collected and analyzed once every other month for the PM samples. Field blanks will be collected and analyzed quarterly for the carbonyl samples and as requested by the ODEQ lab for the SVOC samples. Transport blanks will be collected as requested by the ODEQ lab.

Table 12.2 Duplicate and Blank Schedule

Parameter	Duplicate Frequency	Field Blank Frequency	Transport Blank Frequency
PM_{10}	NA	Bimonthly	per ODEQ request
VOC (Xontech)	Monthly	NA	per ODEQ request
Carbonyl (Xontech)	Monthly	Quarterly	per ODEQ request
SVOC (Tisch PUF)	NA	per ODEQ request	per ODEQ request

The quality control requirements for the associated analytical instrumentation and laboratory activities will be as described in *The ODEQ Air Toxics QAPP*.

13. INSTRUMENT/EQUIPMENT TESTING, INSPECTION AND MAINTENANCE

All of the field sampling equipment for this project has been procured, inspected, tested and accepted by WDOE. The SWCAA site operator will perform routine preventative and corrective maintenance as dictated by procedures and events.

Refer to *The ODEQ Air Toxics QAPP* regarding laboratory instruments and equipment.

14. INSTRUMENT CALIBRATION AND FREQUENCY

Instruments and equipment used in the field will be calibrated at the required frequency stated in the SOPs or manufacturer's specifications or as indicated by quality control checks as shown in Table 12.1.

Laboratory instrumentation will be calibrated consistent with the requirements set forth in the respective analytical methods. Refer to *The ODEQ Air Toxics QAPP* regarding laboratory instruments and equipment.

15. DATA MANAGEMENT

All field records will be maintained by SWCAA as electronic format in a dedicated project folder on the SWCAA server and/or as hardcopy format in a field notebook. These records include field data sheets, flow calculation spreadsheets, flow and leak check records, calibration records, downloaded meteorological data and associated operator notes. Standard operating procedures and operator manuals for the field sampling equipment will be maintained in a procedures notebook by SWCAA.

A hardcopy of the field data sheet and flow calculation sheet, as appropriate, will be returned with each sample to the ODEQ Lab. The ODEQ Lab will combine this field data with analytical results for the respective samples to determine the ambient concentration for each analyte in units of $\mu g/m^3$ or ppbv. Records of these results and all of the laboratory documentation associated with the preparation, analysis and data reduction of the respective samples will be maintained by the ODEQ Lab according to *The ODEQ Air Toxics QAPP*.

The site operator will maintain a site logbook documenting operational and maintenance activities at this monitoring site. The logbook entries will be identified with the date, time, operator, instrument, parameter, and units as appropriate for each documented activity. The logbook will be used to document quality control checks, maintenance, audits, equipment changes and missing or invalid data.

16. ASSESSMENTS AND RESPONSE ACTIONS

A field audit will be conducted at the site by the ODEQ staff to evaluate SWCAA's operation of the monitoring site. The results of the audit will be reported to SWCAA staff such that any corrective actions indicated by the audit can be taken. Responses to specific corrective recommendations will be documented in the site logbook as appropriate.

Refer to *The ODEQ Air Toxics QAPP* for information on assessments and response actions regarding laboratory activities.

17. REPORTS TO MANAGEMENT

The ODEQ Lab will prepare preliminary reports of the ambient concentration results with the associated sampling parameters and submit them to SWCAA quarterly in electronic format. ODEQ will also format and report the results into the EPA's AIRS/AQS database within 90 days of the end of the calendar quarter in which the monitoring was done. ODEQ will prepare and submit a Field Audit Report to SWCAA in electronic format.