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**CLEAN AIR ACT COMPLIANCE FMPC
RESPONSE TO ITEM F OF CLEAN AIR ACT
SECTION - FFCA FEDERAL FACILITIES
COMPLIANCE AGREEMENT**

09/16/86

**WMCO
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REPORT**

FMPC.
Clean Air Act Compliance:
FMPC Response to Item F of Clean
Air Act Section of the Federal
Facilities Compliance Agreement.

60-Day Deliverable

September 16, 1986

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INTRODUCTION

There are nine High Volume Air Sampling Stations at the Feed Materials Production Center situated around the production facility perimeter. Three additional units are located off-site at two area schools and a manufacturing plant. A fourth location is planned at the Shandon School.

These units are Model GMWL-2000H High Volume Air Sampling Systems manufactured by General Metal Works, Inc.

This plan describes the equipment and methods used in the collection of air samples, the calibrations necessary to keep the units operating satisfactorily, and the evaluation and reporting of the analytical results received.

REASON FOR OPERATION AND MAINTENANCE PLAN

This Operation and Maintenance Plan has been prepared to explain the operation of the FMPC environmental air sampling equipment.

This Plan summarizes the operation, maintenance, and control procedures necessary to keep the High Volume Air Sampling System units operating at peak efficiency and to satisfy the 60 day FFCA requirement.

AIR STATION LOCATIONS

<u>Number</u>	<u>Location</u>
BS1	North at Construction Road
BS2	North Access Road
BS3	North of Sewage Treatment Plant
BS4	Southeast at Main Electrical Sub Station
BS5	Southwest at Paddy's Run Road
BS6	West at Paddy's Run Road
BS7	Northwest
BS-ES	Elda School, South Side at Parking Lot
BS-CS	Crosby School, West Side by New Haven Road
BS-10	Albright & Wilson by Parking Lot
BS-8	Northeast of Decontamination on Building
BS-9	East of the North Access Road

OBJECTIVES

The objectives of the Air Monitoring (Sampling) Program are to:

- Provide detailed information on FMPC emissions required for a comprehensive assessment of environmental impacts;
- Provide background information on air quality.

DESCRIPTION OF EQUIPMENT

The high volume air sampling station is set up in an aluminum shelter with a hinged gable roof. The pump is a heavy duty turbine type blower with a high speed motor encased in a plastic housing, which is located in the top of this

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shelter with easy access to the filter media on top. The station also includes an elapsed time indicator, a flow recorder, and a flow control unit.

Designed for continuous operation in an all weather environment, the Model GMWL-2000H is a complete sampling station for the collection of suspended matter. All instruments and components are mounted within the anodized aluminum shelter for protection. The hinged roof facilitates filter media exchange.

Samples of particulate matter in air are continuously collected at nine permanent sampling stations located on the FMPC outer boundary plus three stations located off-site. At each station, air is drawn at a rate of about one cubic meter per minute through an 8 inch x 10 inch filter which is changed weekly. Filters are weighed before use and then reweighed after use to obtain the weight of collected particulates. After reweighing, the filter and its collection of particulates are dissolved in acid and the solutions are analyzed for uranium by the Fluorometric method and beta radioactivity using a Tennelek Low Beta Counter. Counting is done two days after the end of the collection period to assure decay of short-lived radionuclides. After these analyses are completed, the remaining solution is held to provide a long-term composite for analyses of other nuclides.

Filters are changed weekly on Tuesdays.

The air sampling station log book and keys are located in the Environmental and Radiological Monitoring (ERM) Technician's Trailer north of the Control Building.

RESPONSIBILITIES

The Manager of Environmental Compliance shall ultimately be responsible for the Routine Environmental High Volume Air Samples (REHVAS) Program, will be involved in decisions regarding changes in the program, and will receive the results of all sampling operations.

The Manager of the ERM Subsection shall oversee and coordinate the actual collection of data from the REHVAS Program using trained technical staff members.

The ERM Technicians are responsible for performing the calibration and maintaining the file on all calibrations performed.

Response to pumps that are down is to be immediate by the Environmental & Radiological Monitoring Technicians. Pumps are inspected routinely once each day.

Apart from brush replacement, the repair of the pumps is to be performed by the Health & Safety Instrumentation Laboratory personnel. The ERM Technicians are authorized to change brushes when needed.

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COLLECTION OF ROUTINE ENVIRONMENTAL HIGH VOLUME AIR SAMPLES

The following section summarizes the draft procedure "Collection of Routine Environmental High Volume Air Samples," ESH-P-52-001.

Required Equipment

Air sampling station rotameter.

Pre-loaded and bagged "Whatman EPM-1000" filters from the Dosimetry Room.

Air sampling station log book.

Air sampling station keys.

E&RM vehicle.

Analytical Data Sheet, Form FMPC-H7S-736.

Previously tested and calibrated spare High Volume Air Sampler pump.

Spare timer mechanism.

Special Precautions

When the pump motor fails and it is necessary to remove the pump from the pump housing, disconnect electric plug from main outlet on the fence to eliminate any potential for electrical shock.

Anytime a pump or timer stops operating, or if it is not running properly, remove the pump from the housing and take it to the ES&H Instrument Mechanic for repair. Replace the defective part with the spare part. After the pump has been repaired and before the pump is put back into service, be sure to recalibrate the pump. Enter this information into the log book and on the calibration sheet for that pump.

Use care to avoid contamination of the filters during handling.

If changing air sampling station filters in the rain, avoid getting the filters wet. Keep the filter cover on the new filter as long as possible, and exchange the filters under cover of the pump housing top.

Procedure

This procedure describes the equipment and methods to be used in the routine collection of environmental high volume air samples and the evaluation and reporting of the analytical results received.

Proceed to each of the air sampling stations located as shown on the attached "Feed Materials Production Center Environmental Features" and make the filter exchange as described below.

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Obtain the properly numbered air sampling station filter from the Dosimetry Room. Sign the Custody Transfer Record form. Obtain the log book and rotameter from the Industrial Hygiene and Safety Technician Office.

Open the bottom compartment of the pump housing and attach rotameter rubber tubing to the male fitting at the bottom of the pump and read flow rate from the center of the metal ball of the rotameter. Record the flow rate in the log book in column labeled "Ending Flow Rate, Rotameter."

Turn the pump off by depressing the "STOP" toggle switch by the timer.

Record the time reading from the hour timer. Enter this reading in the log book in the column labeled "TIME HOURS."

Record the date in the left-hand column labeled "DATE."

Open the top of the air sampling station pump housing. Unscrew the four wing nuts at the corners of the filter until loosened. Snap the filter cover off of the new cassette and place it on the old cassette. Remove the old filter and replace with the new filter. Tighten the four wing nuts.

Note: Due to the design and construction of the Filter Cassette, the potential for any loss of particulate material from the filter is minimized.

Put the old filter cassette into a clean plastic bag, seal the bag, and mark or tag the bag with boundary station number, date, time and initials.

Read the flow rate from the center of the metal ball of the rotameter. Record the flow rate in the log book in the column labeled "STARTING FLOWRATE, ROTAMETER."

Close the top cover of the pump housing, and close up the lower door to the pump housing. Be sure these doors are securely fastened.

Restart the pump by raising the "STOP" toggle switch and then depressing the "START" toggle switch for a couple of seconds until the pump starts and continues running.

Take filter cassette, rotameter, and log book back to the vehicle. Proceed to the next air sampling station and continue the exchange by repeating the preceding steps until all filters have been exchanged.

Record information and technician's initials in log book.

When the exchange is completed, return the collected filters to the ES&H Room 202A. Fill out data sheet and transfer Chain of Custody to the analyst. Return the rotameter and log book to the Industrial Hygiene and Safety Technician Office.

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Recordkeeping

The technician will calculate the sampler flow rate for each air sampling station during the sampling period. Using the corresponding calibration sheet for each station air sampler and the appropriate rotameter reading recorded in the log book, the technician can determine the flow in CFM from the calibration sheet and record the flow on the data sheet.

The technician will complete the top portion of the Analytical Data Sheet (ADS) in the section for Industrial Hygiene and Safety Department. (Several filter entries may be on one sheet.)

Sample Numbers: Record the number of filters that were exchanged.

Data Collected: Record the date of collection.

By: Record the initials of the person making the exchange.

Route to: Record the initials of the person in the Environmental Compliance Department to whom the analytical results are to be sent.

Location: Record "Air Sampling Stations."

Type of Sample: "Record 'AIR'."

Analyzed For: Uranium (U), Beta, and Particulates.

The Technician will complete the bottom portion of the ADS in the section for IH Department.

Sample Number: Record the air sampling station number (BS-1, BS-2,...), one sample per line.

Sample Description: Record CFM (cubic feet per minute) in this column, starting flow rate on the left side of the column, ending flow rate on the right side of this column. Obtain the flow rate data for each station from the log book as discussed in the first item of this section.

Enter the units in the appropriate column headings.

Determine the number of hours of sampler operation by subtracting the previous timer reading from this timer reading (include tenths of an hour) and enter in the appropriate column.

When the analytical data sheet has been completed, the data sheets must be submitted to the Bioassay Department analyst.

The Bioassay Department analyzes the filters. When the analysis is complete, the results are forwarded to the Environmental Compliance personnel in charge of boundary stations.

Reports

The results of the air sampling program will be evaluated by Environmental Compliance personnel as the results are received on a weekly basis. Any unusual results will be investigated.

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The weekly results will be incorporated into a yearly report that will be published in the "Feed Materials Production Center Environmental Monitoring Annual Report" as required by DOE. This report will be available for review by plant management, DOE, other regulating agencies, and the public.

HIGH VOLUME AIR SAMPLER PUMP CALIBRATION

The following section is a summary of the established procedure provided by the manufacturer in "Operator's Manual for GMW High Volume Air Samplers."

Tools and Equipment Apparatus

Air Sampling Station Log Book

NASN type orifice calibration assembly consisting of a manometer capable of measuring 14" of water, an orifice calibrator, and orifice disc labeled 18, 13, 10, 7, and 5.

Pump Shelter containing a filter holder.

Filter of the type currently in use (i.e., Gelman A/E, Sand S, HU-1, Microsorban, Whatman EPM-1000, etc.)

Quality Control and Repair record cards.

Graph paper (10 x 10 to the inch).

Blank index cards (5 x 7 inches).

Variable Transformer.

GMWL Operators Manual.

Special Precautions

Motor brushes when changed must be seated before any calibration may be performed. After changing, run the transformer to 50% and let run for 1/2 hour. This will prevent arcing and increase motor and brush life.

Procedure

This procedure outlines the steps to be followed by the Environment, Safety and Health representative when servicing and calibrating the High Volume Air Pumps.

This procedure is to be followed when any major change is made in the sampling equipment such as type of filter, type of motor, etc. Each pump will be calibrated at least every 6 months. When minor repairs are made, the calibration may be checked as outlined in steps 7 and 8.

1. Remove the Repair Record cards to determine the pump which has most recently had the brushes replaced. This pump will be used for constructing the calibration curve against which the other pumps will be checked.

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2. Place a clean unused sample filter, of the type currently in use, on the filter holder and then place the pump and filter assembly into the shelter. Plug the pump into the tubing from the rotameter to the pump housing pressure tap.
 3. Turn the variable transformer on and adjust the voltage up until achieving a reading of 60 DCM. Then turn off the pump.
 4. Remove the filter and secure the Calibration Orifice in its place. Attach the water manometer to the Calibration Orifice pressure tap and check that the top of the meniscus is aligned with the zero marker.
 5. Place the #18 Orifice disc secured by gaskets on both sides into the Calibration Orifice and turn on the pump. Observe the manometer deflection and refer to the graph on page 22 of the GMWL operators manual to determine the CFM. Record this manometer CFM and rotameter CFM readings in the log book.
 6. Repeat step 5 with each orifice disc. Using graph paper, plot rotameter reading on the X-axis versus actual flow rate on the Y-axis. From the graph construct two correction factors listing the rotameter readings versus the manometer CFM flow rates. The date of calibration and the person performing the calibration data should be entered on the cards. Remove the calibrated pump and place in service.
 7. The next pump in the inspection order should be set up as in step 4. Place the #18 disc in the Orifice Calibrator, turn on the pump and check the manometer reading. From the graph on page 22 of the GMWL operators manual, determine the CFM flow rate. Refer to the correction factor for the rotameter measurement. Record the flow rate in the boundary station log book and set the flow rate meter at that flow rate.
 8. Remove plate #18 and replace it with plate #7. Turn the pump on and record the manometer reading. Refer to the chart mentioned above and determine the actual CFM flow rate. From the Correction Factor Record card, determine the expected rotameter reading and verify that figure with the actual rotameter reading. If the reading is inaccurate repeat step 7.
 9. Repeat steps 7 - 8 for all the remaining pumps. Record in the log book the date, name of person performing the calibration, and the CFM readings. The Correction Factor graph, a Correction Factor index card, the GMWL Operators Manual, Repair Record Cards, and the Quality Control Cards should be stored in the Pump File in Health and Safety Instrumentation Laboratory.

QUALITY ASSURANCE

All quality related activities are conducted per the requirements of the FMPC Quality Assurance (QA) program. The QA Program will be conducted in accordance with the Environmental Compliance QA Plan as submitted under item B4 of the 30 day submittal. This program includes but it is not limited to:

- Work being conducted in accordance with approved Standard Operating Procedures (SOP).

- Scheduled inspection being performed by trained personnel with calibrated instrumentation.
- Selection, purchase, and verification of filtering media being done according to established specification.
- Complete documentation of all inspections and associated corrective action.
- Complete documentation of all training of personnel.
- Complete documentation of all calibrations traceable to NBS or NASN Standards.

FMPC ENVIRONMENTAL FEATURES

SCALE - 1" = 1200'

