OAK RIDGE NATIONAL LABORATORY

National Emission Standards for Hazardous Air Pollutants QUALITY ASSURANCE PROJECT PLAN

QAP-X-92-ESHC/OECD-002

JUL 22 [illegible]

OAK RIDGE NATIONAL LABORATORY
MANAGED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE U.S. DEPARTMENT OF ENERGY

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June 1, 1992

Dr. Ronald O. Hultgren
Deputy Assistant Manager
Energy Research and Development
DOE Oak Ridge Field Office
Post Office Box 2008
Oak Ridge, Tennessee 37831-6269

Dear Dr. Hultgren:

Completion of Milestone VI.G.1.d - NESHAP Quality Assurance Plan

As required by Milestone 4 in the Compliance Schedule of the Draft Federal Facilities Compliance Agreement, the Environmental Protection Agency (EPA) Region-IV is to receive a copy of the NESHAP Quality Assurance Plan for the Oak Ridge National Laboratory by June 15, 1992. Attached is the final Quality Assurance Plan. The transmittal of this document should complete Milestones 4 and VI.G.1.d.

If you have any questions or require additional information, please contact Laury Hamilton at 576-4526 or Ingrid Walker at 576-5749.

Sincerely,

F. C. Kornegay for

Thomas H. Row, Director
Environmental, Safety,
and Health Compliance

THR:LVH:day

cc w/o enc: P. H. Hight
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cc/enc: D. L. Buhaly, DOE-OR
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I. A. Walker

J. B. Murphy by L V Hamilton June 1 1992

J. B. Murphy Date
Environmental Surveillance Section Head

L. V. Hamilton June 1, 1992

L. V. Hamilton Date
Air Monitoring & Analysis & ORNL Sampling Programs Group Leader

S. E. Lambert June 1, 1992

S. E. Lambert Date
Environmental Surveillance Quality Assurance Specialist

Signatories are affirming that they have reviewed this document, are in agreement with its contents, and are prepared to support and implement all stated requirements.

Acronym Table for the 1991 Annual NESHAP Report

ACD	Analytical Chemistry Division
CFR	Code of Federal Regulations
COR	Contracting Officer Representative
DOE	Department of Energy
EC&D	Office of Environmental Compliance and Documentation
EMP	Environmental Monitoring Plan
EPA	U.S. Environmental Protection Agency
ES	Energy Systems
ESP	Environmental Surveillance and Protection Section
ES&HC	Office of Environmental Safety, and Health Compliance
I&C	Instrumentation and Controls Division
LERC	Laboratory Emergency Response Center
NESHAP	National Emission Standards for Hazardous Air Pollutants
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
QA	Quality Assurance
QAP	Quality Assurance Plan
QAS	Quality Assurance Specialist
QC	Quality Control
SOP	Standard Operating Procedure
TDEC	Tennessee Department of Environment and Conservation
TSD	Technical Services Department

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(continued)

INTRODUCTION

This Quality Assurance (QA) Program Plan is a formal document which describes the orderly assembly of systems, policies, objectives, organizational responsibilities, and procedures by which data of documented quality is produced. In addition, this program plan has been developed within Energy Systems (ES) and Oak Ridge National Laboratory (ORNL) based on EPA requirement 40 CFR 61, App. B, Method 114 in lieu of ORNL procedure QA-L-2-101, "QA Planning," and is compatible with QA documents which have been prepared by the Office of Environmental Safety, and Health Compliance (ES&HC), Office of Environmental Compliance and Documentation (EC&D), Environmental Surveillance and Protection Section (ESP), and the Analytical Chemistry Division (ACD).

A QA Program is established to assure that data produced are of known and documented quality. The authority and responsibility for directing QA activities within the ESP is delegated to the Programs for Excellence Coordinator and the Group Leader for Air Monitoring and Data Analysis. This program plan provides policy and guidance for QA activities. The plan specifies measurement activities requiring QA documentation and data quality assessment for precision, accuracy, and completeness. It provides for a line of communication for the program to appropriate ORNL management and the DOE-ORNL Contracting Officer Representative (DOE-ORNL COR). This plan establishes the basis for conducting system audits and determining adherence to Environmental Protection Agency (EPA) National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements.

Section 61.93 (b)(5)(v) of 40 CFR 61 requires that a QA Plan be developed for National Emission Standards for Hazardous Air Pollutants (NESHAPs) sampling and analysis programs. This plan meets that requirement, and is considered to be part of the overall Quality Program for the ESP.

1.1 RELATIONSHIP TO ORNL QA PROGRAM

The ACD and EC&D each have Quality Assurance Specialists (QAS) who have the specific responsibility for assisting the managing organizations in carrying out their QA programs. The QAS reports functionally to the managing department's Division Director, and administratively to the ORNL QA Manager. The QAS supports the line organization in implementing QA systems and has the authority and independence to identify quality-related problems, initiate and evaluate solutions to such problems, and to verify implementation of solutions. The QAS has access to and interfaces with the highest level line manager directly responsible for performing quality-related activities.

In addition, the ESP has a Program for Excellence which carries out all QA-related activities for the department. These activities can be found in [1]"Environmental Surveillance and Protection Management, Activities, and Programs."

1.2 RELATIONSHIP TO ENVIRONMENTAL PROTECTION AGENCY PROGRAM ELEMENTS

In order to follow and track the required program elements outlined in 40 CFR, Part 61, Appendix B, Method 114, those elements are identified and located as they are found within the contents of this document as shown in Table 1.2.

Table 1.2 Cross Reference of NESHAP QA Requirements and ORNL QA Plan

Method 114 Program Element	ORNL Description	ORNL QA Plan Sections
4.1	Organizational structure Functional responsibilities Levels of authority Lines of communications	2.1 & 2.2
4.2	Administrative controls	3.0
4.3	Sample collection procedure	5.3
4.3.1	Sampling sites & rationale Number of sampling points	5.1
4.3.2	Sample probes Representativeness of samples	5.2 & 7.2
4.3.3	Continuous monitoring systems Sensitivity of systems Calibration procedures Frequency of calibration	5.2 5.3
4.3.4	Sample collection systems Frequency of collection Calibration procedures Frequency of calibration	5.2 & 6.2 5.3 & 6.4
4.3.5	Laboratory analysis procedures Frequency of analysis Calibration procedures Frequency of calibration	7.1 7.2
4.3.6	Sample flow rate measurement Flow rate measurement procedures Calibration procedures Frequency of calibration	5.2 & 6.2 5.3 & 6.4
4.3.7	Effluent flow rate measurement Frequency Procedures Calibration procedures Frequency of calibration	5.2 & 6.2

Table 1.2 Cross Reference of NESHAP QA Requirements and ORNL QA Plan

Method 114 Program Element	ORNL Description	ORNL QA Plan Sections
4.4	Program objectives Accuracy Precision Completeness	4.0, 4.1, 4.2, & 4.3
4.5	Quality of data Replicates, spikes, splits and blanks	4.1 5.4, 6.5, & 7.2
4.6	Sample tracking Sample handling & preservation	7.1 & 8.1 5.3 & 6.4
4.7	Internal Audits External Audits	9.2 9.1
4.8	Corrective actions	11.0
4.9	Periodic reporting	10.0
4.10	Quality assurance project plan	1.0 - 12.0

2.0 PROGRAM ORGANIZATION STRUCTURE

2.1 MONITORING ORGANIZATION

Director-Office of Environmental Compliance and Documentation
Has the general responsibility of administering the activities which are managed by Section Heads within the Office.

Head-Department of Environmental Surveillance and Protection
Responsible for budget, staffing and management of the department which includes, as directly related to this document, development and implementation of all ORNL environmental compliance monitoring programs, associated instrumentation, data analysis, dose assessment, reporting, and Programs for Excellence. Reports to Office Director.

Leader-Air Monitoring and Analysis/Special Projects/Hazardous Waste Group
Responsible for Field Technicians, Field Instrument Engineers, Task Leaders, and specific day-to-day activities, including stack systems, sampling schedules, specific QA programs, reporting, and systems upgrades. Has the authority to revise or alter programs with appropriate notification. Reports to ESP Department Head.

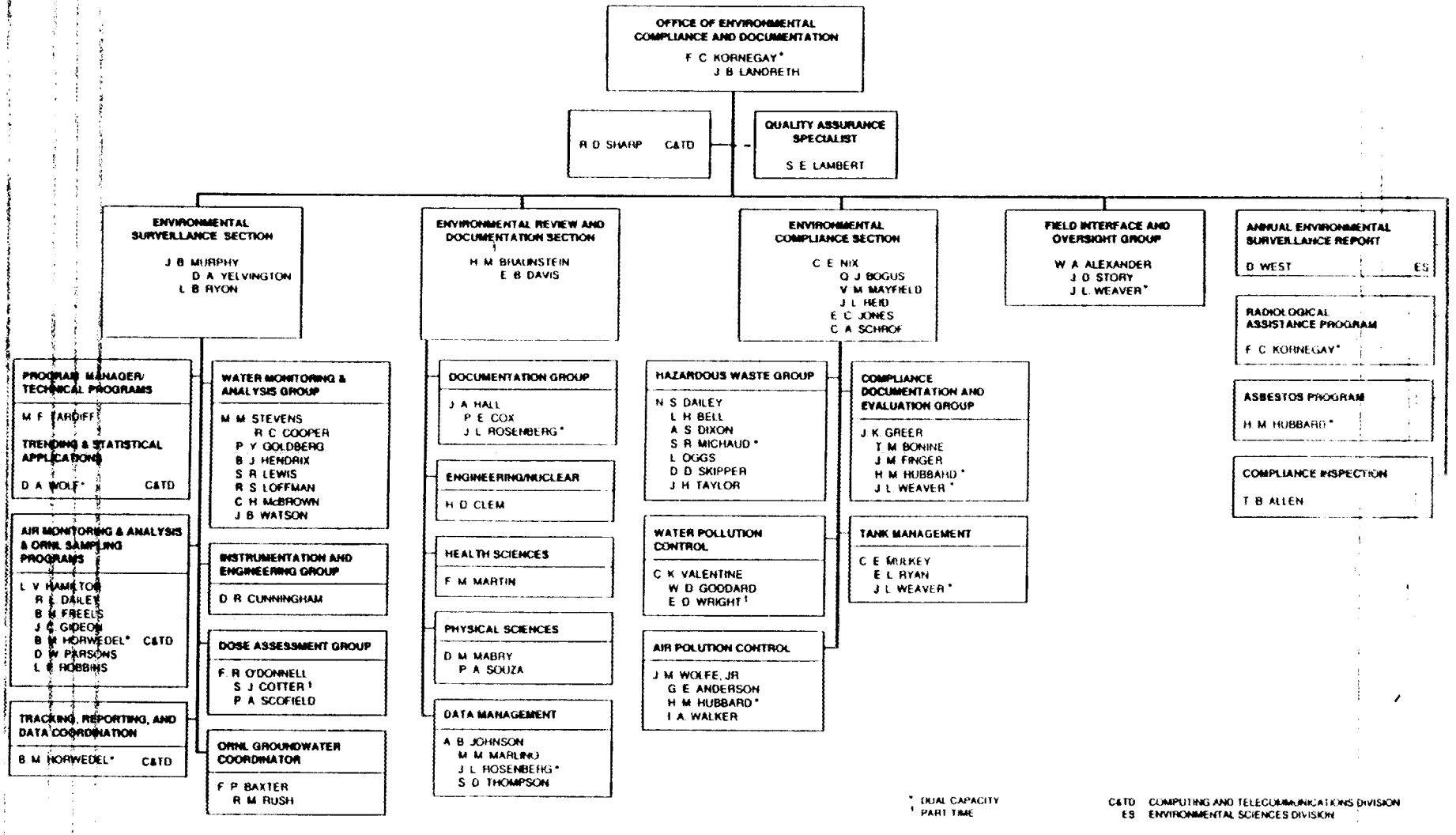
Field Technicians
Perform sampling as specified in permits, compliance plans, and department procedures. Report to Group Leader.

Field Engineering Assistants
Coordinate maintenance and calibration of instruments. Report to Group Leader.

Leader-Dose Assessment Group
Responsible for calculating dose for stack emissions for the Oak Ridge Reservation (ORNL, Y-12, and K-25). Reports to ESP Department Head.

Coordinator-Program for Excellence
Responsible for developing all department Standard Operating Procedures (SOPs), the department's Quality Program, carrying out internal audits of the department, and providing a link with and directly interacting with the Office QAS. Reports to ESP Department Head.

Task Leader-Clean Air Compliance Group
Responsible for interpretation of all applicable regulations and Orders, and minor source calculations. Reports to Head of Compliance Department.



* DUAL CAPACITY
† PART TIME

C&TD COMPUTING AND TELECOMMUNICATIONS DIVISION
ES ENVIRONMENTAL SCIENCES DIVISION

APPROVED: T. C. Kornegay
FOR INTERNAL DISTRIBUTION

ORGANIZATION CHART:
OFFICE OF ENVIRONMENTAL COMPLIANCE AND DOCUMENTATION
OAK RIDGE NATIONAL LABORATORY

EFFECTIVE DATE:
JANUARY 6, 1992

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2.2 ANALYTICAL ORGANIZATION

Director-Analytical Chemistry Division
Has the broad general responsibility of administering the activities which are managed by Section Heads within the Division.

Head-Inorganic and Radiochemistry Section
Responsible for budget, staffing and management of the section which includes, as directly related to this document, development and implementation of all analytical protocols for radiological analysis, associated instrumentation, and reporting results to the ESP. Reports to Division Director.

Leader-Low-Level Radiochemical Analysis Group
Responsible for laboratory analysts and general conduct of the radiochemical laboratory. Reports to Section Head for Inorganic and Radiochemistry.

Head-Operations Section
Responsible for development and management of the Division's Quality Program. Reports to ACD Division Director.

Leader-Quality Programs Group
Responsible for the day-to-day operation and conduct of quality programs, including both QA and Quality Control (QC). Reports to Operations Section Head.

JANUARY 1992

ORNL-DWG 92M-4938

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[11] POST DOCTORAL STUDENT, UNIV. OF PA

CT COMPUTING AND TELECOMMUNICATIONS DIVISION
FM FINANCE AND MATERIALS DIVISION
I INSTRUMENTATION AND CONTROLS DIVISION
QD QUALITY DEPARTMENT
PI PRINCIPAL INVESTIGATOR

3.0 ADMINISTRATIVE CONTROLS

3.1 UNPLANNED RELEASES

There is no federal or state requirement for real-time monitoring of stacks at ORNL, therefore there is no system in place which could detect an unplanned release at an "environmental" level. Stack sampling systems are monitored from a maintenance basis in order to ensure that the system is performing as specified. There is a system in place which monitors stack releases at an "operational" level. This system of alarms is monitored by the Laboratory Emergency Response Center (LERC) and the Waste Operations Computer Center. Both of these systems are manned 24 hours a day. The "[2]X-10 Site Emergency Plan" ORNL/CF-91/71/R1, outlines the actions taken in the case of an emergency.

4.0 QUALITY ASSURANCE OBJECTIVES

The QA objectives of the ORNL NESHAPS are to collect the sample according to the specified procedure without altering its true nature, conduct analyses according to specified procedures, provide a framework for maintaining validated and verifiable data, and to accurately report that data. In order to accomplish this objective, standards for accuracy, precision, and completeness must established.

4.1 ACCURACY

"Accuracy is the degree of agreement of a measurement with a true or known value," as stated in EPA Method 114, Section 4.4. The accuracy of the ORNL continuous samplers is directly related to the design, and the design conforms to the specifications for continuous sampling systems stated in [3]ANSI N13.1-1969 and 40 CFR 61. Appendix A-3 of the [4]"Compliance Plan: National Emission Standards for Hazardous Air Pollutants for Airborne Radionuclides on the Oak Ridge Reservation, Oak Ridge, Tennessee" (Compliance Plan) contains the description and requirements for each continuous sampling system and the status of the ORNL stack system relative to each requirement. ORNL point source measurement systems will meet all of the requirements for continuous samplers after the upgrade is complete.

Mechanisms for demonstrating accuracy will include:

Traceability of Instrumentation - Each measurement device will be assigned a unique identification number. Documentation shall identify the specific measurement device, where and when used, maintenance performance, and standards used for calibration.

Traceability of Standards - Standards and each measurement device will be calibrated against a standard of known or higher accuracy when possible. Calibration standards will be traceable to available standards.

Traceability of Data - Data will be documented to allow complete reconstruction from initial field records through data storage system retrieval.

4.2 PRECISION

"Precision is a measure of the agreement among individual measurements of the same parameters under similar conditions," as stated in EPA Method 114, Section 4.4 Demonstration of precision is normally carried out by activities such as replicate samples, and co-located sampling. Since continuous stack sampling does not lend itself to co-located samplers, simultaneous sampling, and replicate samples; a direct measure of the precision of the sampling can not be obtained. Precision may be estimated or assumed based on the design of the sampling system and its relationship to regulatory requirements for that system.

4.3 COMPLETENESS

Completeness is defined separately for instrumentation, field sampling and laboratory analysis activities. For instrumentation (continuous samplers), an 80 percent completeness requirement should be met. That is, the time the sampler is not in satisfactory operation cannot exceed 20 percent of the sampling period. For field sampling, completeness is a measure of the number of samples collected at a site compared to the number of samples expected to be collected. For laboratory analysis, completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under normal conditions. Completeness is typically expressed as a percentage. Completeness may be determined by dividing the total number of sampling periods, as described in the sampling plan, during a set period of time into the number of valid samples reported during the same period and multiplying by one hundred. The ideal objective for completeness is 100 percent; that is, every sample planned to be collected should be collected, and every sample submitted for a particular analysis should be analyzed. The goal for ORNL will be 100 percent. The minimum allowable data completion requirement for the NESHAP program is 80 percent which conforms to regulatory guidance.

The Group Leader for Air Monitoring and Analysis Programs has the responsibility for the determination of accuracy, precision, and completeness and to meet that standard through sampling program management.

5.0 MONITORING PROGRAM

5.1 Site Selection and Rationale

The ORNL is required to continuously sample radioactive point source emissions if they have the "potential" to cause an equivalent effective dose of 0.1 mrem/yr or greater in accordance with Section 61.93 (b)(4)(i) of 40 CFR 61, Subpart H. Potential is defined as normal operations without pollution control equipment. Based on 1990 emission data, ORNL has identified four major sources of radionuclide emissions that meet the criteria and they are Stacks 2026, 3020, 3039, and 7911.

5.2 MONITORING SYSTEMS

Stack 2026 - Stack 2026 is currently being upgraded to come into compliance with the regulations. The upgrade will be complete by October 15, 1992. The new continuous sampling system will consist of a sample probe, sample transport line, filter, two charcoal canisters, a catalytic converter, a silica gel cartridge, two mass flow controllers and flow totalizers, and two pumps. The sample flow rate will be measured and maintained using the mass flow controller. The sample flow rate will be controlled around a set point designed to maintain isokinecity in the sampler within +/- 20 %. The sampler set point will be reviewed and adjusted quarterly (if necessary) using the current stack flow measurements to insure isokinecity is maintained in the sampler. The filter is used to collect radioactive particulates, charcoal canisters are used as the sampling media for adsorbable gases, and indicating silica gel is used to collect total tritium. Prior to the silica gel cartridge, the gas stream passes through a catalytic converter containing a polonium/platinum catalyst to convert any elemental tritium to tritiated water which is then collected on indicating silica gel. A more detailed description of the sampling system can be found in Appendix A-3 of the "Compliance Plan: National Emission Standards for Hazardous Air Pollutants for Airborne Radionuclides on the Oak Ridge Reservation, Oak Ridge, Tennessee."

The sample probe is located at the 35 foot level in the stack and contains four sampling nozzles. To ensure that a representative sample is collected, the following measures are employed:

* Each nozzle is located in a concentric equal annular area.
* The sampling location meets the criteria of EPA Method 1.
* The sample probe and sample transport line will be cleaned annually following [5]SOP-ESP-003.036, "Stack Probe Cleaning and Sample Collection." The rinsate will be analyzed and the results will be incorporated into the sampling data.
* The sampler flow rate will be set to collect samples isokinetically from the stack.

* The effluent flow rate will be measured quarterly using [6]SOP-ESP-003.039, "Velocity Measurements for Stacks and Ducts", following EPA Method 2. Based upon the change in the effluent flow rate, the sample flow rate will be adjusted on a quarterly basis to maintain isokinecity in the sampler.

The particulate filters and charcoal canisters are collected weekly. The silica cartridges are collected weekly and composited bi-weekly. Variability in the sampling frequency can occur during holidays by +/- 2 days or if the facility operations require special sampling support due to unusual operations.

Stack 3020 - Stack 3020 is currently being upgraded to come into compliance with the regulations. The upgrade will be complete by October 15, 1992. The new continuous sampling system will consist of a sample probe, sample transport line, filter, two charcoal canisters, a mass flow controller and flow totalizer, and a pump. The sample flow rate will be measured and maintained using the mass flow controller. The sample flow rate will be controlled around a set point designed to maintain isokinecity in the sampler within +/- 20 %. The sampler set point will be reviewed and adjusted quarterly (if necessary) using the current stack flow measurements to insure isokinecity is maintained in the sampler. The filter will be used to collect radioactive particulates including strontium, cesium, and plutonium. Charcoal canisters are used as the sampling media for adsorbable gases such as lead. A more detailed description of the sampling system can be found in Appendix A-3 of the "Compliance Plan: National Emission Standards for Hazardous Air Pollutants for Airborne Radionuclides on the Oak Ridge Reservation, Oak Ridge, Tennessee."

The sample probe is located at the 50 foot level in the stack and contains six sampling nozzles. To ensure that a representative sample is collected, the following measures are employed:

* Each nozzle is located in a concentric equal annular area.
* The sampling location meets the criteria of EPA Method 1.
* The sample probe and sample transport line will be cleaned annually following SOP-ESP-003.036, "Stack Probe Cleaning and Sample Collection." The rinsate will be analyzed and the results will be incorporated into the sampling data.
* The sampler flow rate will be set to collect samples isokinetically from the stack.
* The effluent flow rate will be measured quarterly using SOP-ESP-003.039, "Velocity Measurements for Stacks and Ducts," following EPA Method 2. Based upon the change in the effluent flow rate, the sample flow rate will be adjusted on a quarterly basis to maintain isokinecity in the sampler.

The particulate filters and charcoal canisters are collected weekly. Variability in the sampling frequency can occur during holidays by +/- 2 days or if the facility operations require special sampling support due to unusual operations.

Stack 3039 - Stack 3039 is currently being upgraded to come into compliance with the regulations. The upgrade will be complete by October 15, 1992. The new continuous sampling system will consist of a sample probe, sample transport line, filter, two charcoal canisters, a catalytic converter, a silica gel cartridge, two mass flow controllers and flow totalizers, and two pumps. The sample flow rate will be measured and maintained using the mass flow controller. The sample flow rate will be controlled around a set point designed to maintain isokinecity in the sampler within +/- 20 %. The sampler set point will be reviewed and adjusted quarterly (if necessary) using the current stack flow measurements to insure isokinecity is maintained in the sampler. The filters will be used to collect radioactive particulates including strontium, cesium, thorium, and plutonium. Charcoal canisters are used as the sampling media for adsorbable gases such as lead. Indicating silica gel is used to collect total tritium. Prior to the silica gel cartridge, the gas stream passes through a catalytic converter containing a polonium/platinum catalyst to convert any elemental tritium to tritiated water which is then collected on indicating silica gel. A more detailed description of the sampling system can be found in Appendix A-3 of the "Compliance Plan: National Emission Standards for Hazardous Air Pollutants for Airborne Radionuclides on the Oak Ridge Reservation, Oak Ridge, Tennessee."

The sample probe is located at the 50 foot level in the stack and contains six sampling nozzles. To ensure that a representative sample is collected, the following measures are employed:

* Each nozzle is located in a concentric equal annular area.
* The sampling location complies with the criteria of EPA Method 1 section 2.5, Alternate Measurement Site Selection Procedure.
* The sample probe and sample transport line will be cleaned annually following SOP-ESP-003.036, "Stack Probe Cleaning and Sample Collection." The rinsate will be analyzed and the results will be incorporated into the sampling data.
* The sampler flow rate will be set to collect samples isokinetically from the stack.
* The effluent flow rate will be measured quarterly using [7]SOP-ESP-003.040, "Velocity Measurements for Stacks and Ducts using a Unidirectional Probe," following EPA Method 1 Section 2.5. Based upon the change in the effluent flow rate, the sample flow rate will be adjusted on a quarterly basis to maintain isokinecity in the sampler.

The particulate filters and charcoal canisters are collected weekly. The silica cartridges are collected weekly and composited bi-weekly. Variability in the sampling frequency can occur during holidays by +/- 2 days or if the facility operations require special sampling support due to unusual operations.

Stack 7911 - Stack 7911 is currently being upgraded to come into compliance with the regulations. The upgrade will be complete by October 15, 1992. The upgrade consists of replacing the existing probe assembly with a single probe and moving the particulate/adsorbable collection system up to the 50 foot level on the stack. The continuous sampling system consists of a sample probe, sample transport line, filter, two charcoal canisters, a catalytic converter, a silica gel cartridge, two mass flow controllers and flow totalizers, and two pumps. The sample flow rate will be measured and maintained using the mass flow controller. The sample flow rate will be controlled around a set point designed to maintain isokinecity in the sampler within +/- 20 %. The sampler set point will be reviewed and adjusted quarterly (if necessary) using the current stack flow measurements to insure isokinecity is maintained in the sampler. The filters will be used to collect radioactive particulates. Charcoal canisters are used as the sampling media for adsorbable gases such as iodine and lead. Indicating silica gel is used to collect total tritium. Prior to the silica gel cartridge, the gas stream passes through a catalytic converter containing a polonium/platinum catalyst to convert any elemental tritium to tritiated water which is then collected on indicating silica gel. A more detailed description of the sampling system can be found in Appendix A-3 of the "Compliance Plan: National Emission Standards for Hazardous Air Pollutants for Airborne Radionuclides on the Oak Ridge Reservation, Oak Ridge, Tennessee." In addition to the sampling system, there is a continuous monitor for noble gas emissions. The detector is located downstream from the particulate, adsorbable gas, and tritium collection systems. An in-line beta scintillation detector is used to measure the total activity in the gas stream. The detector is placed in a fixed volume. The filtered sample continuously passes through the chamber where the detector monitors the activity present in the volume. The noble gas channel sensitivity is 0.8362 $\mu Ci/cm^3$ with an average detector efficiency of 20.575 $cpm/\mu Ci/cm^3$.

The sample probe is located at the 50 foot level in the stack and contains six sampling nozzles. To ensure that a representative sample is collected, the following measures are employed:

* Each nozzle is located in a concentric equal annular area.
* The sampling location meets the criteria of EPA Method 1.
* The sample probe and sample transport line will be cleaned annually following SOP-ESP-003.036, "Stack Probe Cleaning and Sample Collection." The rinsate will be analyzed and the results will be incorporated into the sampling data.

* The sampler flow rate will be set to collect samples isokinetically from the stack.
* The effluent flow rate will be measured quarterly using SOP-ESP-003.039, "Velocity Measurements for Stacks and Ducts," following EPA Method 2. Based upon the change in the effluent flow rate, the sample flow rate will be adjusted on a quarterly basis to maintain isokinecity in the sampler.

The particulate filters and charcoal canisters are collected weekly. The silica cartridges are collected weekly and composited bi-weekly. Variability in the sampling frequency can occur during holidays by +/- 2 days or if the facility operations require special sampling support due to unusual operations.

5.3 QUALITY ASSURANCE

5.3.1 Sample Handling and Preservation

Samples are collected using [8]SOP-ESP-003.035. Chain-of-Custody is followed using [9]SOP-ESP-003.002 and sampling documentation control is maintained using [10]SOP-ESP-003.014.

5.3.2 Instrument Calibration and Maintenance

A list of equipment requiring calibration and maintenance for the various stack sampling systems is provided in Table 5.3.2 along with the associated frequency of each. Calibration and maintenance procedures are maintained by the Technical Services Department (TSD) in the Instrumentation & Controls Division (I&C). Currently, the procedures are under review and transfer from the ESP Section and do not have SOP numbers assigned. When the transfer is complete, the appropriate procedures will be included. Also, due to the current upgrade of the stack equipment, new procedures may be needed. When the upgrades are complete, the new procedures will be written and incorporated into this document.

5.4 QUALITY CONTROL

The continuous sampling systems do not lend themselves to duplicate or split samples due to the nature of the collection media. However there are some quality control measures that are used to assess the integrity of the samples and they are as follows:

* A clean filter, charcoal canister, and fresh silica gel are submitted to the laboratory with each set of samples. This control blank is used to assure the integrity of the sampling media.

* When collecting adsorbable gases on charcoal canisters, there are two canisters placed in series. Each canister is analyzed individually to determine the effectiveness of the collection media and that breakthrough has not occurred.

* The silica gel used in tritium collection is indicating silica gel. Visual inspection of the silica cartridge after sample collection for color change indicates if breakthrough has occurred. If breakthrough has occurred the analysis will represent a minimum quantity of tritium emissions and it will be flagged in the data.

Table 5.3.2. Schedule of Equipment Calibration and Preventative Maintenance[1]

Instrument	Calibration Frequency (months)	Procedure Number	Preventative Maintenance Schedule (months)
Tritium flow controller & totalizer	12	MMD/CTOT 102I	None
Tritium converter/catalyst	None	Not applicable	6
Noble gas detector	12	MMD/CMNZ 107I	None
Particulate flow controller & totalizer	6	MMD/CMTD 111I	None
Tritium pump	None	Not applicable	12

[1]This schedule reflects the current sampling systems. The calibration and maintenance schedule for the new instrumentation used in the current upgrades of the stack sampling systems may vary. The QA plan will be modified to reflect any changes if needed.

6.0 MINOR SOURCE PROGRAM

6.1 Site Selection and Rationale

As stated in 40 CFR Part 61.93 (b)(4)(i), "For other release points which have a potential to release radionuclides into the air, periodic confirmatory measurements shall be made to verify low emissions." Since ORNL has numerous minor sources that could potentially release radionuclides, a proposal was submitted to EPA Region-IV to limit the area that would be investigated. Using Health Physics criteria for designating Radiological Areas, sources located in/or venting from such an area will be included in the evaluation. Nonradiological Areas will not be evaluated to verify low emissions because they do not present the potential for internal exposure or external exposure. Also, Radiological Areas where contamination can be shown to be almost entirely due to fixed contamination or external radiation sources will not be evaluated for airborne releases. A more detailed description of the minor source evaluation is presented in the Compliance Plan.

6.2 Sampling Methods/Systems

There are a number of minor sources that will be sampled periodically to verify low emissions. Table 6.2.1 provides a summary of the minor sources and the method(s) used to estimate emissions. The sampling methods comply with methods outlined in the NESHAP Compliance Plan. The grab samples will be collected in such a manner that they conform to EPA Method 5 criteria using [11]SOP-ESP-003.041, "Point Source Sampling." If necessary, approval to deviate will be obtained prior to samples being collected. The instrumentation used will meet the criteria outlined in EPA Method 5.

For grouped source 7830 and Stack 7025, an instack sampler will be used to collect a single sample once per quarter. The samples will be collected using [12]SOP-ESP-003.005. The sample flow rate will be measured and maintained using the mass flow controller. The sample flow rate will be controlled around a set point designed to maintain isokinecity in the sampler within +/- 20 %. The effluent flow rate will be measured annually using SOP-ESP-003.039, "Velocity Measurements for Stacks and Ducts."

Stack 7877 operates intermittently and will be sampled only during periods of operation using an instack sampler to collect a single sample once per quarter. The samples will be collected using SOP-ESP-003.005. The sample flow rate will be measured and maintained using the mass flow controller. The sample flow rate will be controlled around a set point designed to maintain isokinecity in the sampler within +/- 20 %. The effluent flow rate will be measured annually using SOP-ESP-003.039, "Velocity Measurements for Stacks and Ducts."

Table 6.2.1 Minor Source Summary

Source	Type of Source	Method of Estimation of Radionuclide Emissions	Frequency of Collection or Estimation	Effluent Velocity Measurement Method
2000	Point	Modified Method 5 prior to HEPA Filters	Every 3 years	EPA Method 2 every 3 years
3018	Point	Health Physics data	Annual	Historical data
3074	Grouped	Sample HEPA filters	1-2 years	Not applicable
3544	Point	Modified Method 5	Annual	Method 2 annually
5505	Grouped	Inventory - 1991	Annual	Not applicable
7025	Point	Instack Sampler	Quarterly	Method 2 annually
7512	Point	Modified Method 5	Annual	Method 2 annually
7830	Grouped	Instack sampler on tank vents - apply this source term to the vault vents	Quarterly	Method 2 annually
7852	Grouped	Apply 7860 source term data	Every three years	Fan rating
7860	Grouped	Use Health Physics data or Modified Method 5 stack sample data and apply source term to the group	Every three years	Fan rating
7567	Point	Apply 7830 source term data	Annual	Fan rating
7569	Point	Apply 7830 source term data	Annual	Fan rating
7877	Point	Instack sampler	First quarter of 1992 only (Stack operates intermittently, will sample quarterly during operations)	Previous Method 2 data
Decommissioned Lab Hoods	Grouped	Isotopic analysis of duct smears.	Every three years	Fan rating
Lab Hoods	Grouped	Inventory	Annual	Not applicable
Misc Rooms	Grouped	Health Physics data	Annual	Fan rating

In the case of grouped source 3074, the HEPA filters themselves will be sampled as they are replaced. The source term from each HEPA will be summed and used as the emission for that facility. This method is not in the "NESHAP Compliance Plan" and will be used pending review by EPA Region-IV.

Another grouped source, decommissioned hoods and associated duct work, needs to be evaluated. A preliminary method of evaluation has been proposed to EPA-Region IV. This method would include taking surface smears from the inside of the ductwork, analyzing the smears for isotopes of concern, and relating that to a source term for the duct. This will be completed first on a duct that can be both smeared and sampled using EPA Method 5. This method is not in the "NESHAP Compliance Plan" and will be used pending review by EPA Region-IV.

6.3 EMISSION CALCULATIONS

Some minor sources will not be sampled, but rather calculations will be made to estimate the radiological emissions. The methods used to calculate emissions are described in the Compliance Plan and include the following:

* Health Physics data
* Radionuclide Inventory Data
* Engineering Estimates and Judgement
* Tank Evaporation Method
* Modification to Appendix D
* Performance Testing of New Processes
* Appendix D of Part 61

Any combination of the above methods may be used to evaluate minor source emissions. If a source does not lend itself to one of these methods and another method is proposed, approval from EPA will be obtained to deviate from the Compliance Plan. Table 6.2.1 summarizes the minor sources, the method used to evaluate the emissions and the frequency of the measurement.

6.4 QUALITY ASSURANCE

6.4.1 Sample Handling and Preservation

Samples are collected using SOP-ESP-003.035. Chain-of-Custody is followed using SOP-ESP-003.002 and sampling documentation control is maintained using SOP-ESP-003.014.

6.4.2 Instrument Calibration and Maintenance

A list of equipment requiring calibration and maintenance for the instack sampling systems is provided in Table 6.4.2 along with the associated frequency of each. Calibration and

maintenance procedures are maintained by the Technical Services Department (TSD) in the Instrumentation & Controls Division (I&C). Currently, the procedures are under review and transfer from the ESP Section and do not have SOP numbers assigned. When the transfer is complete, the appropriate procedures will be included.

6.5 QUALITY CONTROL

The instack sampling systems do not lend themselves to duplicate or split samples due to the nature of the collection media. However there are some quality control measures that are used to assess the integrity of the samples and they are as follows:

* A clean filter, charcoal canister, and fresh silica gel are submitted to the laboratory with each set of samples. This control blank is used to assure the integrity of the sampling media.

* When collecting adsorbable gases on charcoal canisters, there are two canisters placed in series. Each canister is analyzed individually to determine the effectiveness of the collection media and that breakthrough has not occurred.

* The silica gel used in tritium collection is indicating silica gel. Visual inspection of the silica cartridge after sample collection for color change indicates if breakthrough has occurred. If breakthrough has occurred the analysis will represent a minimum quantity of tritium emissions and it will be flagged in the data.

Table 6.4. Schedule of Equipment Calibration and Preventative Maintenance[2]

Instrument	Calibration Frequency (months)	Procedure Number	Preventative Maintenance Schedule (months)
Tritium flow controller & totalizer	12	MMD/CTOT 102I	None
Tritium converter/catalyst	None	Not applicable	6
Particulate flow controller & totalizer	6	MMD/CMTD 111I	None
Tritium pump	None	Not applicable	12

[2]This schedule reflects the current sampling systems. The calibration and maintenance schedule for the new instrumentation used in the current upgrades of the stack sampling systems may vary. The QA plan will be modified to reflect any changes if needed.

7.0 ANALYTICAL PROGRAM

7.1 QUALITY ASSURANCE

All analyses are performed by the ORNL ACD by procedures which have been approved by the ORNL Quality Department and meet all requirements of the EPA. QA as it applies to the ORNL ACD is detailed in the division's QA plan. In addition, all procedures and methods used by the division for analyses are developed to meet all EPA methodology standards.

The frequency of analysis for all samples along with the corresponding analytical procedure is provided in Table 7.1. These analytical methods are based on the principles of measurement described in EPA Method 114.

The analytical laboratory has identified sample custodians who accept custody of samples. Documentation of this acceptance is maintained by Chain-of-Custody forms which are initiated by the field technician and are passed on to the sample custodian. This custody ensures that possession has been traceable from the time samples are collected until the derived data are documented.

7.2 QUALITY CONTROL

In accordance with EPA guidance documents and precision and accuracy standards established in this program plan, a QC program has been developed. This program includes the appropriate use of blanks, replicates, spikes, and duplicate samples where applicable. Calibration procedures for instruments are also contained within the [13]Quality Assurance Program Manual, ORNL/M-806, Section 5, QA-AC-000-0500. Included in calibration procedures are frequency of calibration.

Table 7.1 Summary of Analyses for Major Sources

Location	Media	Frequency	Analytical Method	Method 114 Counterpart	Parameters
2026, 3020, 3039, & 7911	Filter	Weekly	231928	A-4, B-4	Gross alpha and beta
		Quarterly composites	Th 2 31875 U 2 31934 Pu 2 31627 Sr 2 21805 Sequential Determinations of isotopes Sr, Ur, Th, & Pu in Air Filters 2 0961 Determination of U in Air Filter 2 31927	B-3 A-1 A-5 G-1	Gamma scan and isotopic analysis for uranium, plutonium, and thorium.
2026, 3020, 3039, & 7911	Charcoal	Weekly	2 21394 2 21994	G-1 G-1	Gamma scan
2026, 3039, & 7911	Silica Gel	Composited biweekly	2 21871	B-5	Tritium

8.0 DATA ANALYSIS

Data analysis for ORNL is conducted by the ESP. The goals of the analysis program are to:

* estimate radionuclide concentrations and measures of precision and accuracy
* compare concentration estimates to previous values and to regulatory or dose limits
* compare onsite concentrations to reference location concentrations, and
* evaluate the above comparisons

Data analysis and statistical treatment of data is detailed in the [14]"ORR Environmental Monitoring Plan," and in ESP procedures.

8.1 TRACKING

The ESP has an established tracking system which includes the following activities:

sampling schedules (ESP)
sample attainment (ESP)
custody of sample to the laboratory (ESP-ACD)
holding time (if applicable) (ESP)
laboratory analysis (ACD)
transfer of data to ESP (ACD-ESP)
reporting requirements (ESP)
standard operating procedure development or revision

8.2 REPORTING

The main reporting channel for NESHAP data will be through the Annual Compliance Report for NESHAP, and the Annual Site Environmental Report for the ORR. All reporting requirements for NESHAPS data are detailed in the ORR Environmental Monitoring Plan (EMP).

9.0 AUDITS

Audits shall be carried out with written procedures or checklists by personnel who are not directly responsible for performing the audited activities.

9.1 EXTERNAL

External audits carried out by the EPA. TDEC, or DOE may be conducted at their discretion. ESP will notify ORNL Self Assessment Coordinator of any external audits.

9.2 INTERNAL

The ES&HC and the ESP have, in-place, an extensive internal audit program. Audits and surveillances are carried out by the division QAS, and by the Measurements Assurance Group following [15]ORNL QA-L-18-100 "Quality Assurance Audits," and QA-L-18-102 "Surveillance" and ESHC-ADM-008 "Surveillance" and [16]OECD Self Assessment Plan are procedures governing the assessment activity. Internal audits are conducted by the Program for Excellence Coordinator on all aspects of the monitoring program. Details of these programs are contained in individual QAPs and in the ESP Quality Program Plan.

10.0 PROJECT REPORTS

The Leader for Air Monitoring and Analysis Group will make a quarterly report to the ESP Head and EC&D Director on the status of the NESHAP program. Annually, a report will be submitted to the above and also to the DOE (ORNL COR).

The results of any external audit program, including any corrective actions will be submitted by the ESP Leader for Air Monitoring and Analysis Group to the ESP Section Head, the ORNL Self Assessment Coordinator, and the DOE (ORNL COR) within 30 days of receiving in writing final audit findings.

11.0 CORRECTIVE ACTIONS

The identification, cause, and corrective action for significant conditions adverse to quality shall be documented, tracked, and reported to the ESP Head, ESP Program for Excellence Coordinator, and the ORNL COR. Significant conditions adverse to quality include failure to implement major elements of the NESHAP sampling, analytical and QA program; deficiencies in the use of procedures or instructions; failure to implement corrective actions in response to a nonconformance report; and unexpected damage or loss to documentation. Corrective actions shall be implemented in a timely manner.

Occurrences will be reported in accordance with [17]QA-L-16-100 "Occurrence Reporting" and corrective action guidance for ESP is found in QA-L-16-102 "Correction Action."

Any adjustments to activities or procedures will be documented. Such adjustments will be implemented only after appropriate concurrence with the ORNL COR.

12.0 REFERENCES

1. Environmental Surveillance and Protection Management, Activities, and Programs

2. X-10 Site Emergency Plan

3. ANSI N13.1-1969

4. Compliance Plan: National Emission Standards for Hazardous Air Pollutants for Airborne Radionuclides on the Oak Ridge Reservation, Oak Ridge, Tennessee

5. SOP-ESP-003.036 Stack Probe Cleaning and Sample Collection

6. SOP-ESP-003.039 Velocity Measurements for Stacks and Ducts

7. ESP-SOP-003.040 Velocity Measurements for Stacks and Ducts Using a Unidirectional Probe

8. SOP-ESP-003.035

9. SOP-ESP-003.002 Chain of Custody

10. SOP-ESP-003.014 Sampling Document Control

11. SOP-ESP-003.041 Point Source Sampling

12. SOP-ESP-003.005

13. Quality Assurance Program Manual, ORNL/M-806

14. ORR Environmental Monitoring Plan

15. ORNL QA-L-18-100 Quality Assurance Audits
    ORNL QA-L-18-102 Surveillance
    ESHC-ADM-008 Surveillance

16. OECD Self Assessment Plan

17. QA-L-16-100 Occurrence Reporting
    QA-L-16-102 Corrective Action

LABORATORY BUSINESS UNIT

CRITERION/MILESTONE COMPLETION FORM

1) Major Performance Area: Environmental Management

2) Submitter's Signature: for T. H. Row Date: 6/1/92

3) Major Performance Area Counterpart: Buhaly/Belvin

4) Criterion/Milestone I. D. #: VI.G.1.d.

5) Description of Criterion/Milestone: Submit quality Assurance Plan in accordance with Method 114 Appendix B of 40 CFR 61 by June 1, 1992.

6) Due Date - 6/1/92 Completion Date - 6/1/92

7) Signatures: Appr. Rej.

- DOE-OR Performance Area Manager:

  I have reviewed the timeliness and quality of the criterion submission and recommend ____ ____

  Signature _____ Date _____

  Comments _____

- DOE-OR Performance Evaluation Committee Chairperson:

  I have reviewed the criterion submission and recommend ____ ____

  Signature _____ Date _____

  Comments _____

(Required in the event of a dispute):

- DOE-OR COR:

  The criterion submission is ____ ____

  Signature _____ Date _____

  Comments _____

cc: DOE PEC Coordinator
ORNL Award Fee Manager

X-10 SITE OFFICE
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LOG NO. 929248