

Environmental Radioactive Air Sampling and Monitoring Program Considerations

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About Pacific Northwest National Laboratory

Pacific Northwest National Laboratory is a U.S. Department of Energy Office of Science national laboratory where interdisciplinary teams advance science and technology and deliver solutions to America's most intractable problems in energy, the environment, and national security. PNNL employs 4,900 staff, has an annual budget of nearly \$1.1 billion, and has been managed by Ohio-based Battelle since the Laboratory's inception in 1965. This work was sponsored by DOE under Contract DE-AC05-76RL01830.

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INTRODUCTION

Considerations for environmental radioactive air sampling and monitoring are increasingly important as regulatory agencies promulgate requirements for the measurement and quantification of radioactive contaminants released to the environment. The concepts used in radioactive air sampling and monitoring include a basis for sampling and monitoring with established criteria for sampling media and analytical requirements, quality assurance, compliance reporting, and continual improvement.

SAMPLING AND MONITORING



Direct effluent (point source) sampling of the exhaust is typically conducted downstream of the last disturbance and all abatement controls.



Radioactive air sampling and monitoring may include direct effluent measurement and environmental surveillance. For direct effluent sampling, emissions may come from several industries such as medical isotope production laboratories, hospitals, and research institutes. For environmental surveillance, emissions tend to emanate from discrete pathways such as waste piles, abandoned buildings, breather tanks, or contaminated land masses.



Environmental monitoring stations are usually sited at or near the facility boundaries or nearby public areas.



QUALITY ASSURANCE

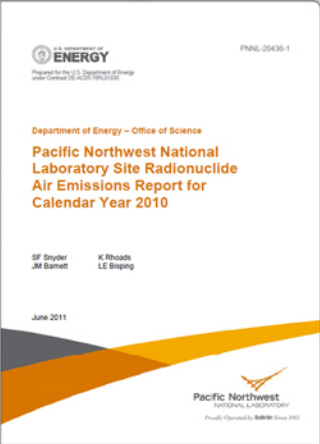
Assessment of and conformance to the regulations and permit authorization requirements enable the facility to demonstrate compliance. An organization should evaluate its activities and document its baseline compliance. Additionally, compliance requires the implementation of a robust QA program capable of passing an external audit.



COMPLIANCE REPORTING

An annual report on the emissions of radioactive material has several aspects to consider. It may be required to include specific information based on applicable regulations or permits and be certified by a responsible individual. Results of reported emissions can then be converted to an off-site dose. Basic elements are identified below:

- ▶ Facility description
- ▶ Emission point description
- ▶ Emissions reporting
- ▶ Input parameters and dose assessment
- ▶ Non-routine releases
- ▶ Supplemental information



CONCLUSIONS

In 2010, the Pacific Northwest National Laboratory Site began radiological operations with the potential for radioactive air emissions and the results of associated sampling and monitoring were first reported in 2011. The Laboratory has utilized these program considerations to implement a comprehensive radioactive air sampling and monitoring program. Continual improvement comes from embracing opportunities to improve the sampling and monitoring base of knowledge, utilizing the assessment process to provide the necessary feedback to make incremental changes in a program to improve the overall result, and publishing results of special studies to provide valuable information to other facilities. This vibrant program is capable of assuring the public, demonstrating low emissions of radioactive material, and complying with environmental regulations.

References

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