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March 7, 1995

MEMORANDUM

TO: Edgar Thornton, Deputy Secretary
New Mexico Environment Department

THROUGH: Ed Kelly, Director
Water and Waste Management Division

BSK Benito Garcia, Chief
Hazardous and Radioactive Materials

FROM: *JP* John Parker, Program Manager
Environmental Surveillance Section
DOE Oversight Program, HRMB

SUBJECT: Shrouded Probe Emissions Monitoring at LANL

This memo is submitted to provide a brief summary on issues involved with the use of a shrouded probe to monitor air emission from stacks at Los Alamos National Laboratory (LANL).

Regulatory Background:

Operations at LANL which emit or have the potential to emit radionuclides are evaluated using criteria established in the U.S. EPA's radionuclide emissions standard, 40 CFR 61.93(b), to determine what type of monitoring requirements will apply. When evaluated in this manner, some of the emissions stacks at LANL require continuous monitoring, using a sampling probe placed within the stack in accordance with specific criteria.

EPA requires that the sampling method follows the guidance of the American National Standards Institute (ANSI), which specifies the design of the sampling probe, the placement criteria and the number of sampling points. However, EPA regulations allow the use of alternative sampling approaches if it can be demonstrated that the ANSI standard is not practical at a given site.



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LANL has applied for approval of an alternative method which would: replace the recommended sharp-edged probe with a shrouded probe, use a single probe in lieu of the recommended "rake" of multiple probes, and perform sample extraction at a constant flow rate rather than the variable flow rate used in the recommended isokinetic probe.

The alternative methodology proposed by LANL was developed by the Aerosol Technology Laboratory at Texas A&M University. The benefits of the new methods are based upon a number of complex considerations involving the fluid dynamics of stack sampling. In summary, these benefits are as follows:

- 1) Improved sampling efficiency through lessening sample loss to the walls of the sampling probe.
- 2) Sampling efficiency less dependent upon stack velocity. Therefore sample representivity can be assured through a greater range of operating conditions.
- 3) Sampling can be accomplished at a constant flow rate, rather than the more problematic variable flow rate required by isokenetic samplers.

Since the mathematical criteria used to determine the placement of the shrouded probe are more restrictive than an isokinetic probe, it is expected in many cases that rather than completely re-doing the stack ductwork some type of mechanical mixing element would need to be added upstream of the single-point sampler.

EPA has been negotiating a Federal Facilities Compliance Agreement (FFCA) with DOE for LANL air emissions since 1991. Use of alternative methodologies have been part of these ongoing negotiations. EPA has apparently given its approval to use the shrouded probe, however the placement criteria and additional stipulations were thought to be too burdensome by LANL and therefore the recommended isokenetic-type samplers will be used.

Should you require additional information on this subject please advise.

cc: Eric Aaboe