Washington State Department of Health

STATEMENT OF LYNN ALBIN
RADIATION HEALTH PHYSICIST
WASHINGTON STATE DEPARTMENT OF HEALTH
BEFORE THE
SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT
OF THE
COMMITTEE ON SCIENCE AND TECHNOLOGY
UNITED STATES HOUSE OF REPRESENTATIVES

May 3, 2007

Dear Chairman Miller and Ranking Member James Sensenbrenner,

Thank you for the opportunity to provide testimony on the experience of Washington State in our environmental radiation monitoring efforts following the termination of the Environmental Measurements Laboratory (EML) Quality Assurance Program (QAP). My name is Lynn Albin and I have worked for the Washington State Department of Health for 21 years. I began as a radiochemist with the responsibility to provide accurate analyses of radioactive contaminants in environmental samples. Presently, I am a radiation health physicist with the Department of Health's Office of Radiation Protection. My responsibilities include using radiochemical analyses to assess public and environmental health risks and to provide oversight of federal and state-licensed facilities that could potentially release radioactive contaminants in the environment. Additionally, I am the liaison between Office of Radiation Protection and the Department's Public Health Laboratory (PHL). In this capacity, I am responsible for analyzing radiochemical data to determine its quality and validity.

The Washington State Department of Health has operated an environmental radiation monitoring program since 1961. The early program looked primarily at atmospheric fallout from nuclear weapons tests. The program later expanded to evaluate off-site environmental impacts from related to the operation of nuclear facilities and in the case of a radiological emergency. An essential part of the assessments is the independent analysis of environmental samples.

All of the samples collected by the Department of Health are analyzed at the Public Health Laboratory. The Laboratory has the capability to analyze for very low levels of naturally occurring radionuclides, mixed fission products and source materials in any environmental media.

Of particular interest to the Department of Homeland Security, the Public Health Laboratory analyzes the air we breathe, the water we drink, the soil in which we grow our food, the food we eat and the external radiation levels that surround us. The Laboratory also uses rapid methods to screen deposition samples to quickly identify radioactive contaminants. The data provided is the basis of environmental assessments and decisions made during radiological emergencies. I

cannot emphasize enough how important it is that we are confident that the data is both accurate and precise when we make public health decisions.

When it was part of the Department of Energy, the Environmental Measurements Laboratory, provided performance testing samples for exactly the type of work the Public Health Laboratory performs. This program was available at no charge to the Public Health Laboratory and was an important component of laboratory quality assurance. Through this program, the Public Health Laboratory was supplied with environmental samples that contained well-quantified amounts of radionuclides. The Laboratory analyzed the samples and reported the results back to EML. EML would then evaluate the data and document the accuracy of the submitted result against the known value and against the mean value submitted by all participating laboratories.

As far as I know, all radiochemistry laboratories supporting environmental monitoring in the Northwest participated in the Quality Assessment Program. Because the QAP results for all laboratories were included in the summary reports, I was able to use these reports when reviewing performance of other Northwest environmental radiochemistry labs.

Additionally the QAP provided a link to the scientists within Environmental Monitoring Laboratory. Radiochemists who developed many of the classical methods for analyzing radionuclides in environmental samples worked for EML. These methods were compiled into a manual that is widely regarded as the standard of radiation measurement techniques. As a new radiochemist, I was handed that manual as the basis of understanding radiochemistry. This practice continues today.

It wasn't only the EML performance testing samples and the radiochemistry manual that benefited the quality of measurements; it was also that the chemists themselves were easily approached to assist Public Health Laboratory chemists in solving questions regarding radiochemistry. Radiochemistry is part science and part art. The science behind chemistry allows the separation and concentration of specific radionuclides but there is also an art requiring experience to correctly interpret the resulting data. It takes years of experience to be proficient in radiochemistry. The Environmental Measurements Laboratory assisted the Public Health Laboratory in evaluating the ability to correctly interpret spectral data through consultation and through their Gamma Spectrometry Data Evaluation Program. This program provided simulated spectral data to the Laboratory to test the accuracy of the gamma-ray spectrometry software and the ability of the chemist to correctly interpret the results of their own software. There is no replacement for this program.

The Quality Assurance Program was one of several performance testing programs in which the Public Health Laboratory participated. Table 1 attached to this testimony summarizes the history of those programs. When the QAP program terminated, the Department of Health lost a cost-effective resource for evaluating laboratory performance as well as the resource provided by EML scientists themselves. The Public Health Laboratory replaced the QAP with a performance testing program provided by a private laboratory. This private laboratory provides the same environmental media and tests that were previously provided by QAP. The disadvantage of the new program is that it is expensive. In fact, this year the Public Health Laboratory could not

afford to fully participate in this performance testing program. While there is no legal requirement to participate in all performance tests, laboratories cannot be certified by EPA to analyze drinking water samples or be qualified to perform environmental measurements in support of the Department of Energy's Environmental Management's activities without successfully passing a minimum number of tests. Performance testing is important for assessment of laboratory capabilities as well as important to the Department of Health's credibility when we use laboratory data to support decisions. The value of the performance testing program comes into play when data or decisions are questioned. From Washington State's point of view, the more performance tests we have to support our laboratory results, the better.

Two examples of how the Quality Assurance Program helped prepare Washington State to respond to actual emergency situations are the State's response to the fires on the Hanford Nuclear Site in 2000 and the Department of Homeland Security's TOPOFF2 exercise in 2003.

During the Hanford fire, the State mobilized field teams to collect samples. The Laboratory provided quick-turnaround results and health physicists interpreted results and guided decision makers regarding protective actions. As the fire burned, wind created concern that soil surface contamination would be blown offsite. The Department of Health analyzed soil, airborne particulates and charred vegetation samples. Sampling results showed that the first responders were not working in a radiological hazardous environment and no offsite public or environmental health impact existed.

It is just as critical that decision makers are confident that the laboratory has reached appropriate detection limits even in cases where data reveal no impact. QAP provided an independent evaluation of laboratory performance that specifically supported credibility of Washington State protective actions. Performance testing is essential in assuring that if results are questioned, there is a reliable method to verify data. Washington State, since losing the program, participates less often in performance testing programs because of budget considerations.

During TOPOFF2, Washington State had to make quick assessments of radiological conditions following a simulated terrorist attack. The first samples analyzed by the Public Health Laboratory were non-standard media: deposition collected on tape and soiled bandages from a victim of the initial simulated blast. These samples provided the hazard description and were followed by the customary environmental samples such as air particulates and soil. Although unplanned, samples collected by other agencies including the Environmental Protection Agency and the Federal Radiological Monitoring and Assessment Center were also brought to the Public Health Laboratory for analysis. The laboratory's strong quality assurance program gave confidence that the initial assessments were correct even though the samples were not commonly analyzed at the laboratory. It further provided evidence to other agencies using the State's laboratory services that the laboratory had documented verification that it was capable of accurately and precisely measuring radioactive contamination in environmental samples. Once again the data reported by the Public Health Laboratory was used to support protective action decisions. Confidence in that data was essential.

In 2003 the Department of Health participated in a performance test sponsored by the National Institute of Science and Technology designed to test the capability and capacity of the laboratories to quickly measure radioactive contaminants in environmental media as well as in synthetic urine and feces. This was the first such performance test and Washington State was one of two states that participated. The samples were a challenge to complete within the designated time and required adjustments in measurement protocol. One of the findings of the study was an appreciation for the analytical uncertainty in the reported result which was much higher than for traditional performance tests. This gave rise to questions of how good is good enough for emergency samples, how do we communicate analytical uncertainty to decision makers and how, in turn, will that uncertainty be factored into protective actions? These are all questions that remain unanswered and could be a starting point for future EML support to states for homeland security-related emergencies.

As the person who reviews the data validity, I must feel confident that I am handing the best information to the decision makers. The welfare of the public, emergency workers, and the environment rely on the quality of the laboratory data. These results form the basis for decisions concerning health risk, food embargos, and population relocation. Performance testing supports data quality assessment by providing an independent evaluation of laboratory capability. This independent review helps defend data, whether they support recommended protective actions that may impact someone's life or whether they lend confidence to a recommendation of no action.

In conclusion, accurate, defensible data improves environmental assessments and enables managers to make better and more cost-effective decisions. The termination of the QAP affects Washington State because we cannot guarantee the level of participation in the private laboratory replacement program due to costs. Cutting performance programs weakens the defensibility of the data. We also are missing the solid technical support to the Public Health Laboratory provided by the Quality Assurance Program and the scientists at the Environmental Measurements Laboratory.

Biography for Lynn Albin

Lynn Albin is a Radiation Health Physicist with the Washington State Department of Health. She has 21 years experience in the environmental radiation field assessing public and environmental health. She began her career analyzing plutonium in coral soils from the United States nuclear testing ground in the Marshall Islands. As part of her graduate studies in Radiation Ecology at the University of Washington, Ms. Albin studied the removal rates of radioactive contaminants from the Marshall Island Atoll ecosystem.

Ms. Albin was influential in initiating environmental monitoring at the University of Washington to assess radioactive fallout following the 1986 fire and explosion of the Chernobyl Nuclear Power Plant in the Ukraine. The Washington State Department of Social and Health Services (later the Department of Health) also responded to the accident. In addition to monitoring fallout

in air, rainwater and ambient radiation levels, the Department monitored for contamination in milk, food and other environmental media. In June of 1986, Ms. Albin joined the chemists at the State's Public Health Laboratory to assist with their response to the Chernobyl accident.

In 1988, Ms. Albin transferred within the Department of Health to the Office of Radiation Protection. As a senior Radiation Health Physicist, her duties include environmental oversight of radiological monitoring programs within Washington State including the US Department of Energy's Hanford Site and the Energy Northwest nuclear power plant. She provides technical support in radiological site assessment and radiological risk evaluation and leads quality assurance activities within the Office of Radiation Protection.

Ms. Albin is the laboratory liaison between the Office of Radiation Protection and the Department of Health's Public Health Laboratory. She is responsible for analyzing radiochemical data to determine validity, quality and scientific significance related to public health and the environment.

Ms. Albin is member of the Department of Health's Emergency Response Team. In this capacity she uses her expertise to provide support at the project level to ensure sampling design and analysis criteria are appropriate and technically defensible. She has participated in numerous emergency response drills and exercises including TOPOFF2 and has also responded to actual emergencies such as the fire on the US Department of Energy's Hanford site in 2002.

Ms. Albin is a member of the Conference of Radiation Control Program Directors' G-2 Committee on Ionizing Measurements.

Table 1. WASHINGTON STATE DEPARTMENT OF HEALTH PERFORMANCE TESTING PROGRAMS

	Cost	Frequency	Availability	Food	Milk	Water	Air	Soil/ Sediment	Vegetation	Ambient Gamma Radiation	Urine	Feces	Comments
EML QAP	no charge	quarterly	Laboratories performing analyses of environmental media			X	X	X	X				Discontinued Program in 2004
EML TLD Intercomparison	no charge	once per three years	Laboratories that perform environmental ambient gamma measurements							X			International Intercomparison sponsored in part by EML. Last intercomparison 1997
EPA	no charge	quarterly	Laboratories analyzing drinking water and environmental media	X	X	X	X						Discontinued Program in 1998
FDA FERN	no charge	semiannually	FDA Agreement network of laboratories	X	X								Began 2002
RESL MAPEP	no charge		Laboratories that perform environmental analyses in support of Department of Energy's Office of Environmental Management activities			X	X	X	X				Began 1994
ERA for Drinking Water	$2,650	quarterly	Labs with valid radiochemical licenses			X							Designed program to replace discontinued EPA program
ERA for Mixed Media	$2,280	semiannually	Labs with valid radiochemical licenses			X	X	X	X				Designed program to replace discontinued EPA program
NIST NRIP	$10,000	quarterly	Accredited Radiochemistry Laboratories			X	X	X			X	X	Provides Direct Traceability to NIST. WDOH participated in only the emergency response round of NRIP
QATF	no charge	annually	Laboratories that support environmental radiological monitoring programs			X		X	X	X			Initiated 1985. WA State Governor's Task Force for Environmental Radiation Programs. Real environmental sample taken and split among participants. No direct traceability to NIST

EML	Environmental Measurements Laboratory
EPA	Environmental Protection Agency
ERA	Environmental Resource Associates®
FDA	Food and Drug Administration
FERN	Food Emergency Response Network
MAPEP	Mixed Analyte Performance Evaluation Program
NIST	National Institute of Science and Technology
NRIP	NIST Radiochemistry Intercomparison Program
QATF	Quality Assurance Task Force of the Pacific Northwest
RESL	Radiological and Environmental Sciences Laboratory
TLD	Thermoluminescent Dosimeters