

February 2007

MARY ANN PARKHURST  
Staff Scientist  
Radiological Science and Engineering Group

DOCKETED  
USNRC

May 16, 2007 (4:05pm)

OFFICE OF SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

EDUCATION

- B.A., Chemistry, University of New Mexico, 1973
- M.S., Ecology Major - Biological Studies, Washington State University, 1980
- M.S., Radiological Sciences, University of Washington, 1990

EXPERIENCE

Mrs. Parkhurst, a health physicist since 1982, joined Battelle-Northwest in October 1976. Her previous experience with Battelle and in industry includes five years as an analytical chemist and four years conducting environmental assessments of energy facilities. Mrs. Parkhurst has extensive experience as a principal investigator and a project manager in radiological and environmental assessments of depleted uranium munitions and in environmental aspects of nuclear and nonnuclear energy production. She leads teams that evaluate the environmental impacts of nuclear power plant permits and licenses for the Nuclear Regulatory Commission (NRC) and leads radiological investigations of depleted uranium munitions for the U.S. Department of Defense (DOD). Previous to these efforts, she assisted with improvements to neutron track detectors for the U.S. Department of Energy (DOE) and applied track detection techniques to retrospective radon exposure and alpha particle energy discrimination for the National Cancer Institute (NCI).

- NRC Permits and Licenses. Mrs. Parkhurst has led the technical environmental evaluation of five existing nuclear power plants seeking license renewal and one of the first early site permit (ESP) applications.
  - License Renewal Environmental Impact Analysis: The first nuclear power plant to apply for renewal of its operating license was Calvert Cliffs. Mrs. Parkhurst led the technical effort investigating environmental issues of its continued operation during the proposed renewal term. This effort resulted in an environmental impact statement (October 1999), one of several major steps required for NRC approval of an operating license extension for 20 additional years. Since that time, she has led the full license renewal environmental evaluation process of the Hatch Nuclear Plant and the H.B. Robinson Steam Electric Plant and led the process through the draft EIS stage (with a publicly released EIS) for the Catawba Nuclear Station and the Brunswick Steam Electric Plant. She has also contributed to the health physics analysis of several license renewal EISs.
  - Early Site Permit Environmental Impact Analysis. Three applications were received by NRC in 2003 for an ESP to evaluate existing sites for one or more additional nuclear units. Mrs. Parkhurst led the first effort investigating the environmental issues at the North Anna Power Station site. The final EIS was published in December 2006.
- Depleted Uranium. Mrs. Parkhurst is a DU subject matter expert with environmental, safety, and health issues related to the military use of DU munitions. She manages and has been a principal investigator of numerous U.S. Army projects evaluating the hazards of munitions containing depleted uranium (DU). Some of these projects include the following:

U.S. NUCLEAR REGULATORY COMMISSION

In the Matter of Dominion Nuclear North Anna, LLC

Docket No. 52-008-ESP Official Exhibit No. 22

OFFERED by: Applicant/Licensee Intervenor \_\_\_\_\_

NRC Staff

Other \_\_\_\_\_

IDENTIFIED on 4/24/07 Witness/Panel Parkhurst

Action Taken: ADMITTED REJECTED WITHDRAWN

Reporter/Clerk HC

- *DU Aerosol Generation and Risk Assessment.* The evaluation of aerosols generated inside armored vehicles perforated by large caliber DU munitions was the objective of the recently completed Capstone DU aerosol study. This multi-laboratory project, for which she was Principal Investigator, underwent extensive peer review inside and external to the U.S. Army. This multi-organizational field and laboratory investigation provides information useful in assessing aerosol concentrations and personnel doses from occurrences similar to firing incidents that occurred during the 1991 Gulf War and from possible future battlefield actions. She also managed the human health risk assessment based largely on the results of the Capstone test.
- *DU Soil Contamination.* Environmental issues surrounding production and testing of DU munitions are also of concern to the Army and have been investigated by Mrs. Parkhurst and her colleagues. One of her most recent environmental effort is an evaluation of DU soil contamination and resuspension data. In another, she led the multi-organizational effort to investigate the dispersion of DU oxides from the burning of an unloaded Bradley Fighting Vehicle and identify appropriate recovery actions. She also assisted with the preparation of the environmental assessment for the M919 cartridge and has provided information in support of the M829 series and M900 environmental assessments. She directed an experimental analysis of the oxidation of metallic uranium, its consequences in demilitarization operations, and its transport through soil.
- *Hazard Classification Tests of DU Munitions.* She has managed or coordinated explosive hazard classification tests of the depleted uranium (DU) M829 and M829E3 large-caliber cartridge and the M919 small-caliber cartridge to determine the hazards of the ammunition to external heat and proximity to an explosion force. The dispersion of radioactive material, both as airborne and ground contamination, was evaluated to determine its potential downwind dispersion. She also assisted in the hazard analysis of the M833 large-caliber cartridge by analogy to tungsten and other DU cartridges, establishing its probable explosive, fragmentation, and radiological hazards.
- *Radiological Assessments of DU Munitions.* The radiological assessment of various DU munitions and the health and safety issues regarding their storage and transport, the potential downwind hazards in the event of a munitions fire, and the dose rates to personnel carrying DU munitions in fighting vehicles are issues she and her colleagues have addressed in several studies. She has conducted the dosimetry studies of the M829A1, M829A2, M829E3, M900, and M919 rounds and the dosimetry within the Abrams tank and Bradley vehicle. She also assisted with the dose modeling for the Camp Doha fire, in which DU munitions burned.

### **Professional Affiliations**

Columbia Chapter of the Health Physics Society  
National Health Physics Society  
American Chemical Society

## Publications and Presentations

### *NRC Projects*

*Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site.* NUREG-1815 Vols 1 and 2. U.S. Nuclear Regulatory Commission, Washington, D.C.

*Draft Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site.* NUREG-1815, Suppl. 1. U.S. Nuclear Regulatory Commission, Washington, D.C.

*Draft Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Supplement 25 Regarding Brunswick Steam Electric Plant, Units 1 and 2.* 2005. NUREG-1437, Suppl. 25. U.S. Nuclear Regulatory Commission, Washington, D.C.

*Draft Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site.* 2004. NUREG-1811, U.S. Nuclear Regulatory Commission, Washington, D.C.

*Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Supplement 13 Regarding Robinson Nuclear Plant, Unit 2.* December 2003. NUREG-1437, Suppl. 13. U.S. Nuclear Regulatory Commission, Washington, D.C.

*Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Supplement 9 Regarding Catawba Nuclear Station, Units 1 and 2.* December 2002. NUREG-1437, Suppl. 9. U.S. Nuclear Regulatory Commission, Washington, D.C.

*Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Supplement 4 Regarding the Edwin J. Hatch Nuclear Plant.* 2001. NUREG-1437, Suppl. 4., U.S. Nuclear Regulatory Commission, Washington, D.C.

*Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Supplement 1 Regarding the Calvert Cliffs Nuclear Power Plant.* 1999. NUREG-1437, Suppl. 1., U.S. Nuclear Regulatory Commission, Washington, D.C.

Kennedy, W. E., M. A. Parkhurst, R. L. Aaberg, K.C. Rhoads, R. L. Hill, and J. B. Martin. 1992. *Evaluation of Exposure Pathways to Man from Disposal of Radioactive Materials into Sanitary Sewer Systems.* NUREG/CR-5814, PNL-7892, U.S. Nuclear Regulatory Commission, Washington, D.C.

Parkhurst, M. A., K. C. Rhoads, J. B. Martin, W. D. McCormack, and S. M. Neuder. 1989. "Potential Doses to the Public from Radionuclides in Municipal Sewage Sludge." Presented at the 34th Annual Meeting of the Health Physics Society, June 25-29, 1989, Albuquerque, New Mexico.

Parkhurst, M. A., W. N. Herrington, J. B. Martin, B. A. Napier, and S. M. Neuder. 1988. "Evaluation of Exposure Pathways to Man from Disposal of Radioactive Materials into Sanitary Sewer Systems." Presented to the Health Physics Society, July 4-8, 1988, Boston, Massachusetts.

Parkhurst, M. A., D. E. Hadlock, R. Harty, and J. L. Pappin. 1986. *Radiological Assessment of BWR Recirculatory Pipe Replacement*. NUREG/CR-4494, PNL-5742. U.S. Nuclear Regulatory Commission, Washington, D.C.

Parkhurst, M. A., R. Harty, and D. E. Hadlock. 1986. "Radiological Issues of Primary Coolant Pipe Replacement at Five BWR Nuclear Plants." Presented to the Health Physics Society, June 29-July 3, 1986, Pittsburgh, Pennsylvania.

Parkhurst, M. A., and G. R. Hoenes. 1984. "Occupational Exposure Reduction in Major Steam Generator Repairs." *Nuclear Plant Safety* 2(3):4-6.

Parkhurst, M. A., G. R. Hoenes, and R. J. Serbu. 1983. "Occupational Exposure Reduction in Steam Generator Repair and Replacement." *Transactions of the American Nuclear Society* 45:643-644.

Parkhurst, M. A., L. A. Rathbun, and D. W. Murphy. 1983. *Radiological Assessment of Steam Generator Repair and Replacement*. NUREG/CR-3540, PNL-4209. U.S. Nuclear Regulatory Commission, Washington, D.C.

#### *U.S. Army Projects*

Parkhurst, M. A. 2005. *Estimating Depleted Uranium Aerosol Doses and Risks: An Overview of the Capstone Depleted Uranium Aerosol Study and the Capstone Human Health Risk Assessment*. Presentation to the Congressional Research Advisory Committee on Gulf War Veterans' Illnesses, April 7, 2005, Washington, D.C.

Parkhurst, M. A., E. G. Daxon, G. M. Lodde, F. Szrom, R. A. Guilmette, L. E. Roszell, G. A. Falo, C. B. McKee. 2005. *Depleted Uranium Aerosol Doses and Risks: Summary of U.S. Assessments*. Battelle Press, Columbus, Ohio; slightly revised from 2004 report prepared for the U.S. Army by Battelle, PNWD-3476.

Guilmette, R. A., M. A. Parkhurst, G. Miller, F. F. Hahn, L. E. Roszell, E. G. Daxon, T. T. Little, J. J. Whicker, Y. S. Cheng, R. J. Traub, G. M. Lodde, F. Szrom, D. E. Bihl, K. L. Creek, C. B. McKee. 2005. *Human Health Risk Assessment of Capstone Depleted Uranium Aerosols*. Battelle Press, Columbus, Ohio; slightly revised from 2004 report prepared for the U.S. Army by Battelle, PNWD-3442.

Parkhurst, M. A., F. Szrom, R. A. Guilmette, T. Holmes, Y. S. Cheng, J. L. Kenoyer, T. E. Sanderson, J. W. Collins, R. W. Fliszar, K. Gold, J. Beckman, and J. Long. 2004. *Capstone Depleted Uranium Aerosols: Generation and Characterization, Volumes 1 and 2*. Prepared for the U.S. Army by Pacific Northwest National Laboratory, PNNL-14168.

F. Szrom, E. G. Daxon, M. A. Parkhurst, G. A. Falo, J. W. Collins. 2004. *Level II and Level III Inhalation and Ingestion Dose Methodology: Calculations and Results*. Prepared for the U.S. Army by Pacific Northwest National Laboratory, PNWD-3480.

Parkhurst, M. A., J. A. Glissmeyer, M. H. Smith, D. L. Haggard, K. M. Krupka, E. D. Jenson, B. W. Arey, C. Z. Soderquist, R. J. Traub. 2004. *Burn Test of M829A3 Cartridges in PA171 Containers*. Prepared for the U.S. Army, PNNL-14496.

Parkhurst, M. A. 2003. "Modeling Aerosols Generated Inside Armoured Vehicles Perforated by Depleted Uranium Ammunition," in Proceedings of the Workshop on Internal Dosimetry of Radionuclides, September 9-12, 2002, Oxford, *Radiation Protection Dosimetry*, Vol. 105, Nos 1-4, pp 167-170.

Parkhurst, M. A., D. E. Bihl, and R. K. Piper. 2003. *Radiological Assessment of the 120-MM, APFSDS-T, M829A3 Cartridge in the PA171 Container*. Prepared for the U.S. Army, PNNL-14276.

Parkhurst, M. A., F. Szrom, R. A. Guilmette, T. Holmes, Y. S. Cheng, J. L. Kenoyer, T. E. Sanderson, J. W. Collins, R. W. Fliszar, K. Gold, J. Beckman, and J. Long. 2002 (prepublication draft). *Capstone Depleted Uranium Aerosols: Generation and Characterization*. Prepared for the Department of the Army, Richland, Washington.

Parkhurst, M. A. and J. A. Glissmeyer. 2001. *Depleted Uranium Aerosols from In-Bore Test Firing of M919 Cartridges*. Prepared for the U.S. Army, PNNL-13584.

Piper, R.K. and M. A. Parkhurst. 2001. *Hazard Classification and Radiological Assessment of the M919, 25-mm APFSDS-T Cartridge in PA125 Metal Shipping Containers by Analogy to Previous Test Results*. Prepared for the U.S. Army, PNNL-13649.

Parkhurst, M. A. 2001. *Bradley Fighting Vehicles: Dose Rates from 25-mm M919 Ammunition*. Prepared for the U.S. Army, PNNL-13493.

Parkhurst, M.A., J. Mishima, M.H. Smith. 1999. *Bradley Fighting Vehicle Burn Test*. Prepared for the U.S. Army, PNNL-12079.

Parkhurst, M. A., J. R. Johnson, J. Mishima, and J. L. Pierce. 1995. *Evaluation of DU Aerosol Data: Its Adequacy for Inhalation Modeling*. Prepared for the U. S. Army, PNL-10903.

Parkhurst, M. A., L. H. Munson, K. R. Sump. 1995. *Radiological Aspects of M774 Demilitarization*. Prepared for the U.S. Army, PNL-10759.

Parkhurst, M. A., G.W.R. Endres, L. H. Munson, and L. L. Nichols. 1995. *Evaluation of DU Contamination in Gun Tubes*. Prepared for the U.S. Army, PNL-10352.

Parkhurst, M. A., G. Akabani, R. K. Piper, L. L. Nichols, and G. W. R. Endres. 1995. *Depleted Uranium Radiation Fields from 25-MM, M919 Packaged Ammunition*. Prepared for the U.S. Army, PNL-10590.

Parkhurst, M. A., S. J. Jette, J. Mishima, J. A. Glissmeyer, D. E. Hadlock, and L. L. Nichols. 1994. *Aerosols from Test-Firing Depleted Uranium Munitions*. Prepared for the U. S. Army, PNL-9741.

Parkhurst, M. A. and R. I. Scherpelz. 1994. *Dosimetry of Large Caliber Cartridges: Updated Dose Rate Calculations*. Prepared for the U. S. Army, PNL-8983.

Parkhurst, M. A. and R. I. Scherpelz. 1993. *Radiological Assessment of the 120-MM, APFSDS-T, M829A2 Cartridge*. Prepared for the U.S. Army, PNL-8890.

Stoetzel, G. A., M. A. Parkhurst, and L. H. Munson. 1993. *Evaluation of M774 Cartridge Disassembly and DU Corrosion Product Analysis*. Prepared for the U.S. Army. PNL-8827.

Parkhurst, M. A. 1993. "PNL Experience with Depleted Uranium Radiological Exposure and Environmental Behavior," Presented at the Depleted Uranium Health and Safety Information Exchange Meeting, Oak Ridge Tennessee, November 30-December 1, 1993.

Erickson, R. L., C. J. Hostetler, R. J. Serne, J. R. Divine, and M. A. Parkhurst. 1993. *Geochemical Factors Affecting Degradation and Environmental Fate of Depleted Uranium Penetrators in Soil and Water*. PNL-8527, Prepared for the U.S. Army by Pacific Northwest Laboratory, Richland, Washington.

Piper, R. K., L. L. Nichols, G. W. R. Endues, M. A. Parkhurst. 1993. *Dose Algorithm for Munitions Containing Depleted Uranium*. PNL-8634. Prepared for the U.S. Army by Pacific Northwest Laboratory, Richland, Washington.

Parkhurst, M. A. and R. I. Scherpelz. 1993. *Radiological Assessment of the 120-MM, APFSDS-T, M829A2 Cartridge*. PNL-8890. Prepared for the U.S. Army by Pacific Northwest Laboratory, Richland, Washington.

Stoetzel, G. A., M. A. Parkhurst, and L. H. Munson. 1993. *Evaluation of M774 Cartridge Disassembly and DU Corrosion Product Analysis*. Prepared for the U.S. Army. PNL-8827.

Parkhurst, M. A., P. J. Mellinger, L. H. Munson, and J. A. Lubek. 1992. *Evaluation of Potential Cleanup Strategies, Naval Weapons Center DU Target Site*. Prepared for the U.S. Army. PNL-7981.

Mishima, J., D. E. Hadlock, and M. A. Parkhurst. 1991. *Radiological Assessment of the Cartridge 105-MM, APFSDS-5, M900 by Analogy to Previous Test Results*. Pacific Northwest Laboratory, Richland, Washington.

Parkhurst, M. A., D. E. Hadlock, and L. L. Nichols. 1991. *Radiological Assessment of M1 and M60A3 Tanks Uploaded with M900 Cartridges*. Pacific Northwest Laboratory, Richland, Washington.

Parkhurst, M. A., J. Mishima, D. E. Hadlock, S.J. Jette. 1990. *Hazard Classification and Airborne Dispersion Characteristics of the 25-mm, APFSDS-T XM919 Cartridge*. PNL-7232, Pacific Northwest Laboratory, Richland, Washington.

Erikson, R. L., R. J. Serne, J. R. Divine, C. J. Hostetler, and M. A. Parkhurst. 1990. *Theoretical and Experimental Considerations Involving the Environmental Behavior of the 25-MM, APFSDS-T XM919 in Soil and Water*. Pacific Northwest Laboratory, Richland, Washington.

Hadlock, D. E., and M. A. Parkhurst. 1990. *Radiological Assessment of the 25-mm, APFSDS-T XM919 Cartridge*. PNL-7228, Pacific Northwest Laboratory, Richland, Washington.

Parkhurst, M. A., and K. L. Soldat. 1989. *Radiological Assessment of the 105-mm, APFSDS-T XM919 Cartridge*. PNL-6896, Pacific Northwest Laboratory, Richland, Washington.

Haggard, D. L., W. N. Herrington, C. D. Hooker, J. Mishima, M. A. Parkhurst, R. I. Scherpelz, L. A. Sigalla, and D. E. Hadlock. 1986. *Hazard Classification Test of the Cartridge, 120-mm, APFSDS-T, M829: Metal Shipping Container*. PNL-5928, Pacific Northwest Laboratory, Richland, Washington.

Mishima, J., M. A. Parkhurst, C. D. Hooker, and D. E. Hadlock. 1986. *Hazard Classification of the Cartridges 105-mm, APFSDS-T, M774 and M833 in Metal Shipping Containers: by Analogy to Previous Test Results*. PNL-6084, Pacific Northwest Laboratory, Richland, Washington.

Mishima, J., M. A. Parkhurst, R. I. Scherpelz, and D. E. Hadlock. 1985. *Potential Behavior of Depleted Uranium Penetrators Under Shipping and Bulk Storage Accident Conditions*. PNL-5415, Pacific Northwest Laboratory, Richland, Washington.

### ***Retrospective Radon Analysis***

Steck, D. J., M. C. R. Alavanja, R. W. Field, M. A. Parkhurst, D. J. Bates, and J. A. Mahaffey. 2002. "<sup>210</sup>Po Implanted in Glass Surfaces by Long-Term Exposure to Indoor Radon," *Health Physics*, Vol. 83(2):261-271.

R. W. Field, D. J. Steck, M. A. Parkhurst, J. A. Mahaffey, and M. C. R. Alavanja. 1999. "Intercomparison of Retrospective Radon Detectors," *Environmental Health Perspectives*, 107(11)905-910.

Mahaffey, J.A., M.C.R. Alavanja, M.A. Parkhurst, E. Berger, and R.C. Brownson. 1999. "Estimation of Past Radon Exposure History for Analysis of a Residential Epidemiological Study," *Radiation Protection Dosimetry*, 83(3) 239-248.

Mahaffey, J.A., M.A. Parkhurst, T. E. Hui, R. C. Brownson, and M. C. R. Alavanja. 1996. "Factors Affecting Use of CR-39 Surface Monitor Technology to Estimate Past Exposure to Indoor Radon," *Journal of Exposure Analysis and Environmental Epidemiology*, Vol. 6(4)425-437.

Mahaffey, J. A., M. A. Parkhurst, A. C. James, F. T. Cross, M. C. R. Alavanja, J. D. Boice, S. Ezrine, P. Henderson, and R. C. Brownson. 1993. "Estimating Past Exposure to Indoor Radon from Household Glass," *Health Physics*, volume 64, (4):381-391.

### ***Neutron Dosimetry***

Parkhurst, M. A. 1996. "Neutron Dosimetry," In *Applications of New Technology: External Dosimetry*, Jack Higginbotham, Editor. Medical Physics Publishing, Madison, Wisconsin.

Parkhurst, M. A. 1992. "Combination TLD/TED Dose Assessment," in Proceedings of the TLD User Group Symposium, November 10-13, 1992, San Antonio, Texas.

Parkhurst, M. A. 1991. "Combination TLD/TED Progress," in the Proceedings of the Eleventh Department of Energy Workshop on Personnel Neutron Dosimetry, June 4-7, 1991, Las Vegas, Nevada.

Parkhurst, M. A. 1991. "Ongoing Developments in Neutron Detection Using CR-39," Presented at the Third Conference on Radiation Protection, October 21-24, 1991, Orlando, Florida.



Parkhurst, M. A.: 1990. *The Use of Boron Radiators to Enhance the Response of CR-39 Exposed to Low Energy Neutrons*. Thesis submitted to University of Washington, Seattle, Washington.

Parkhurst, M. A., and E. P. Moen. 1990. "CENDOS-EURADOS 1988 Joint Irradiations: Results from Pacific Northwest Laboratory." *Response of Proton-Sensitive Etched Track Detectors to Fast Neutrons: Results of a Joint Multi laboratory Experiment*. Gesellschaft fUr Strahlen- und Umweltforschung, Munchen, W. Germany, pp 97-102.

Parkhurst, M. A. 1990. "Recent Developments and Future Application of CR-39 in Neutron Dosimetry." Presented to the Health Physics Society, June 24-28, 1990, Anaheim, California.

Parkhurst, M. A., and B. M. Richardson. 1989. "Boron Radiators: Potential for Using CR-39 for High and Low Energy Neutron Detection." Presented at the 34th Annual Meeting of the Health Physics Society, June 25-29, Albuquerque, New Mexico.

Nichols, L. L., A. W. Endres, M. A. Parkhurst, and W. A. Decker. 1989. "Angular Dependence and Field Tests of CR-39." Presented at the 34th Annual Meeting of the Health Physics Society, Albuquerque, New Mexico.

Hadlock, D. E., L. W. Brackenbush, R. V. Griffith, D. E. Hankins, M. A. Parkhurst, and C. M. Stroud. 1988. *Personnel Neutron Dose Assessment Upgrade, Vol 1: Personnel Neutron Dosimetry Assessment*. PNL-6620, Pacific Northwest Laboratory, Richland, Washington.

Hadlock, D. E., and M. A. Parkhurst. 1988. "Advances in the Development of CR-39 Based Neutron Dosimeters." *Radiation Protection Practice*, Vol. 1. Seventh International Congress of the International Radiation Protection Association, IRPA 7.

Parkhurst, M. A. 1988. "Comparison of Neutron Track Detector Sensitivity as a Function of the Etching Process." *Radiation Protection Practice*, Vol 1. Seventh International Congress of the International Radiation Protection Association, IRPA 7.

Parkhurst, M. A. 1988. "Detecting Low Energy Neutrons using CR-39 with Boron Radiators." Presented to the Health Physics Society, July 4-8, 1988, Boston, Massachusetts.

Parkhurst, M. A. 1987. "Neutron Energy Response as a Function of Type of Etching Process." Presented to the Health Physics Society, July 5-9, 1987, Salt Lake City, Utah.

Parkhurst, M. A., and D. E. Hadlock. 1987. "Summary of Results Obtained at Pacific Northwest Laboratory from Joint Neutron Irradiations of Neutron Track Detectors." *Neutron Irradiations of Proton-Sensitive Track Etch Detectors: Results European/USA/Canadian Irradiations*. KfK 4305, EURADOS-CENDOS Report, 1987-01, Kernforschungszentrum Karlsruhe, W. Germany.

Parkhurst, M. A., D. E. Hadlock, and L. G. Faust. 1986. "Semi-Empirical Model of Neutron and Charged Particle Interactions with CR-39." *Nuclear Tracks* 12(1-6):593-596.

Hadlock, D. E., and M. A. Parkhurst. 1986. "Electrochemical Development of Particle Tracks in CR-39 Polymer Dosimeters," *Nuclear Tracks* 12(1-6):185-187.

Hadlock, D. E., and M. A. Parkhurst. 1986. "Methods to Increase the Energy and Dose Sensitivity of CR-39." Presented to the Health Physics Society, June 29-July 3, 1986, Pittsburgh, Pennsylvania.

Parkhurst, M. A. (Scientific Secretary). 1984. *Tenth International DOE Workshop on Personnel Neutron Dosimetry*. PNL-SA-12352, Pacific Northwest Laboratory, Richland, Washington.

Parkhurst, M. A., D. L. Haggard, P. L. Tomeraasen and D. E. Hadlock. 1984. "Trials and Tribulations of Processing CR-39 for Neutron Dosimetry." Presented to the Health Physics Society, June 3-8, 1984, New Orleans, Louisiana.

Brackenbush, L. W., D. E. Hadlock, M. A. Parkhurst and L. G. Faust. 1983. "A Method to Improve the Evaluation of Combination Track Etch Dosimetry/ Spectrometer." Presented to the 12th International Conference on Solid State Nuclear Track Detectors, September 4-10, 1983, Acapulco, Mexico.

Parkhurst, M. A. (Scientific Secretary). 1983. *Ninth DOE Workshop on Personnel Neutron Dosimetry*. PNL-SA-10714, Pacific Northwest Laboratory, Richland, Washington.

#### *Other Projects*

Parkhurst, M. A., Y. Onishi, and A. R. Olsen. 1981. "A Risk Assessment of Toxicants to Aquatic Life Using Environmental Exposure Estimates and Laboratory Toxicity Data." *Aquatic Toxicology and Hazard Assessment: Fourth Conference*, ASTM STP 737, pp. 59-71.

Parkhurst, M. A., G. Whelan, Y. Onishi, and A. R. Olsen. 1981. *Simulation of the Migration, Fate, and Effects of Diazinon in Two Monticello Steam Channels*. Prepared for the U.S. Army Medical Bioengineering Laboratory by Battelle, Pacific Northwest Laboratories, Richland, Washington.

Watson, D. G., M. A. Parkhurst, and G. E. Wukelic. 1981. *Environmental Impact Statement Implementation, Plan: Jersey Central Power and Light Company Sayreville Generating Station Units 4 and 5. Sayreville, New Jersey*. PNL-3430-6, Pacific Northwest Laboratory, Richland, Washington.

Cowan, C. E., M. A. Parkhurst, R. J. Cole, D. Keller, P. J. Mellinger and R. W. Wallace. 1980. *Some Implications of In-Situ Uranium Mining Technology Development*. PNL-3439, Pacific Northwest Laboratory, Richland, Washington.

Cowan, C. E., and M. A. Parkhurst. 1980. *Proceedings of the Workshop on In-Situ Mining Technology*, November 28-30, 1980, Corpus Christi, Texas.

Onishi, Y., G. Whelan, M. A. Parkhurst, A. R. Olsen, and P. J. Gutknecht. 1980. *Preliminary Assessment of Toxaphene Migration and Risk in the Yazoo River Basin, Mississippi*. Prepared for the U.S. Environmental Protection Agency, Battelle, Pacific Northwest Laboratory, Richland, Washington

Onishi, Y., S. M. Brown, A. R. Olsen, M. A. Parkhurst, S. E. Wise, and W. H. Walters. 1979. *Methodology for Overland and Instream Migration and Risk Assessment of Pesticides*. Prepared for the U.S. Environmental Protection Agency by Battelle, Pacific Northwest Laboratories, Richland, Washington.