

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
PRIVATE FUEL STORAGE, L.L.C.	)	Docket No. 72-22-ISFSI
	)	
(Independent Spent	)	
Fuel Storage Installation)	)	

JOINT AFFIDAVIT OF SAM A. CARNES, PAUL R. NICKENS AND  
MICHAEL J. SCOTT CONCERNING OGD CONTENTION O, BASIS 1

Sam A. Carnes ("SAC"), Paul R. Nickens ("PRN"), and Michael J. Scott ("MJS"), being duly sworn, do hereby state as follows:<sup>1</sup>

1(a). (SAC) My name is Sam A. Carnes. I am employed as a member of the research staff in the Center for Energy and Environmental Analysis at Oak Ridge National Laboratory ("ORNL") in Oak Ridge, Tennessee. I am providing this affidavit under a technical assistance contract between the staff of the Nuclear Regulatory Commission ("Staff") and ORNL. A statement of my professional qualifications is attached hereto as Attachment 1.

1(b). (PRN) My name is Paul R. Nickens. I am employed as Senior Research Scientist, in the Environmental Technology Division, at Pacific Northwest National Laboratory ("PNNL") in Richland, Washington. I am providing this affidavit under a technical assistance contract between the NRC Staff and PNNL. A statement of my professional qualifications is attached hereto as Attachment 2.

1(c). (MJS) My name is Michael J. Scott. I am employed as Staff Scientist, in the Energy Science and Technology Division, at PNNL in Richland, Washington. I am providing this affidavit

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<sup>1</sup> Each individual paragraph as to which an affiant is attesting herein is identified by parenthetically listing the affiant's initials after the paragraph number. For paragraphs attributed to all of the affiants, no designation of the affiants' initials appears.

under a technical assistance contract between the NRC Staff and PNNL. A statement of my professional qualifications is attached hereto as Attachment 3.

2. This Affidavit is prepared in support of the "NRC Staff's Response To Applicant's Motion For Summary Disposition of OGD Contention O - Environmental Justice" ("Staff Response") filed herewith, concerning the "Applicant's Motion For Summary Disposition of OGD Contention O - Environmental Justice" ("Motion") and the "Statement of Material Facts on Which No Genuine Dispute Exists" ("Statement of Material Facts") attached thereto, filed by Private Fuel Storage, L.L.C. ("PFS" or "Applicant") on May 25, 2001. The statements of material fact set forth by the Applicant with respect to Basis 1 of Contention OGD O are addressed herein as follows: Material Fact Statement Nos. 4, 6, 9, 12, and 13 (Sam A. Carnes); Material Fact Statement Nos. 7, 8 and 10 (Paul R. Nickens); Material Fact Statement Nos. 5, 6, 10, 12, and 13 (Michael J. Scott).<sup>2</sup>

3. As part of our official responsibilities, we assisted the NRC Staff in its evaluation of the potential environmental impacts related to the Applicant's proposed construction and operation of an independent spent fuel storage installation ("ISFSI") on the Reservation of the Skull Valley Band of Goshutes ("Reservation") located in Skull Valley, Utah. Further, we assisted in the preparation of the Staff's "Draft Environmental Impact Statement for the Construction and Operation of an Independent Spent Fuel Storage Facility on the Reservation of the Skull Valley Band of Goshute Indians and the Related Transportation Facility in Tooele County, Utah," NUREG-1714, issued in June 2000 ("DEIS"), and are currently assisting in the preparation of the NRC Staff's Final EIS ("FEIS") related to this proposed facility.

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<sup>2</sup> Statement number 11, pertaining to groundwater resources, is addressed by Richard H. Ketelle in the NRC Staff's affidavit concerning Basis 5 of Contention OGD O, filed simultaneously herewith.

**Sam A. Carnes**

4. (SAC) As part of my official responsibilities, I reviewed the Applicant's Motion and the Statement of Material Facts attached thereto, in which PFS seeks summary disposition of Contention OGD O. My review included the Declaration of Roger Bezdek, which was attached to the Applicant's Motion. With respect to the Applicant's Statement of Material Facts, I examined those statements which relate to work I have done or am doing with respect to the socioeconomic impact sections of the DEIS and the FEIS. As relevant to Basis 1 of the contention, these portions of the Applicant's Statement of Material Facts are in Statement numbers 4, 6, 9, 12, and 13.

5. (SAC) On the basis of my review of the Applicant's Environmental Report ("ER"), the Applicant's Motion, the Declaration of Dr. Bezdek, and the DEIS, I am satisfied that Material Facts Nos. 4, 6, 9, 12, and 13 in the Statement of Material Facts attached to the Applicant's Motion are correct.

6. (SAC) The evaluation in the DEIS reflects that the preferred location for the proposed PFS facility ("PFSF") is in the northwest corner of the Reservation. Specifically, the Staff's evaluation of the sociological and economic effect of the proposed PFSF, including the Staff's evaluation of any potential environmental justice concerns, reflects this preferred location. See DEIS, §§ 4.5, 4.6, 6.1.5, 6.1.6, and 6.2.

7. (SAC) Based on my review, I agree with the Applicant's view that the proposed PFSF would not have an adverse economic effect on the Skull Valley Band. Further, I agree with the Applicant's view that the concerns raised by OGD in Basis 1 of Contention OGD O regarding economic effects outside the reservation have been addressed satisfactorily, and no genuine dispute of material fact exists with respect to these matters.

**Paul R. Nickens**

8. (PRN) As part of my official responsibilities, I thoroughly reviewed relevant literature pertaining to past Native American occupation, land use, and subsistence practices in Skull Valley, Utah. In addition, I reviewed the Applicant's Motion and the Statement of Material Facts attached thereto, in which PFS seeks summary disposition of Contention OGD O. With respect to the Applicant's Statement of Material Facts, I examined those statements which relate to work I have done or am doing with respect to the cultural resources sections of the DEIS and the FEIS. As relevant to Basis 1 of the contention, these portions of the Applicant's Statement of Material Facts are in Statement numbers 7, 8 and 10.

9. (PRN) On the basis of my review of the Applicant's ER, the Applicant's Motion, and the DEIS, I am satisfied that Material Facts No. 7, 8, and 10 in the Statement of Material Facts attached to the Applicant's Motion are correct.

10. (PRN) Based on my review, and as set forth in the DEIS, I am satisfied that the proposed PFSF would have only a small potential, if any, for affecting Tribal cultural values or traditional cultural properties.

11. (PRN) In addition, I am satisfied that the issues raised in Contention OGD O concerning cultural resources were considered and addressed in the DEIS. *See, e.g.,* DEIS §§ 3.6.2 et. seq., 4.6.1, 4.6.2, and 4.6.5. Thus, the DEIS (a) discusses past cultural resource surveys that identified all visible archaeological and historic sites within the Applicant's project areas; and (b) identifies the potential, if any, for project activities to affect traditional cultural properties or other resources of cultural value to the Skull Valley Band within Skull Valley.

12. (PRN) Accordingly, I agree with the Applicant's view that the DEIS has adequately discussed the sociological impacts of the proposed PFS project on the Skull Valley Band, and no genuine dispute of material fact exists with respect to these matters. Further, I agree with the

Applicant's view that the concerns raised by OGD in Basis 1 of Contention OGD O regarding sociological effects have been addressed satisfactorily, and no genuine dispute of material fact exists with respect to these matters.

**Michael J. Scott**

13. (MJS) As part of my official responsibilities, I reviewed the Applicant's Motion and the Statement of Material Facts attached thereto, in which PFS seeks summary disposition of Contention OGD O. With respect to the Applicant's Statement of Material Facts, I examined those statements which relate to work I have done or am doing with respect to the environmental justice sections of the DEIS and the FEIS. As relevant to Basis 1 of the contention, these portions of the Applicant's Statement of Material Facts are in Statement numbers 5, 6, 10, 12, and 13.

14. (MJS) On the basis of my review of the Applicant's ER, the Applicant's Motion, the Declaration of Dr. Bezdek, and the DEIS, I am satisfied that Material Facts Nos. 12 and 13 in the Statement of Material Facts attached to the Applicant's Motion are correct.

15. (MJS) In addition, based on the evaluation of economic impacts set forth in the DEIS and Sam A. Carnes' statement in paragraph 7 above, and my conclusion set forth in paragraph 14 above, I agree with the Applicant's view that the proposed PFSF would not have an adverse economic effect on the Band, and would not represent an impact to the Band that would be an environmental justice concern.

16. (MJS) Further, on the basis of my review of the Applicant's ER, the Applicant's Motion, and the DEIS, I am satisfied that Material Facts Nos. 5, 6, and 10 in the Statement of Material Facts attached to the Applicant's Motion are correct.

17. (MJS) In addition, based on the evaluation of sociological and cultural impacts set forth in the DEIS and Paul R. Nickens' statement in paragraphs 10 and 11 above, and my conclusion in paragraph 16 above, I am satisfied that any adverse sociological impact the proposed

PFSS might have on the Skull Valley Band would not be high, and would not represent an impact to the Band that would be an environmental justice concern.

18. (MJS) Finally, I am satisfied that the issues raised in Contention OGD O, Basis 1, concerning environmental justice were considered and addressed in the DEIS. *See, e.g.*, DEIS § 6.2 ("Environmental Justice"), and DEIS Appendix E ("Census Bureau Data As Used in Environmental Justice Analysis"). Thus, the DEIS discusses: (1) the potential environmental and socioeconomic impacts of the PSFS; and (2) the particular interrelated cultural, social, occupational, historical, economic and health factors that might make any impacts on the Goshutes and other low-income and minority groups more likely, disproportionate, and negative. Accordingly, I agree with the Applicant's view that the concerns raised by OGD in Basis 1 of Contention OGD O regarding economic effects on the Reservation and sociological effects have been addressed satisfactorily, and no genuine dispute of material fact exists with respect to these matters.

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19. (SAC) I hereby certify that the foregoing statements in paragraphs 1(a) and 2-7 above are true and correct to the best of my knowledge, information, and belief.

Sam A. Carnes  
Sam A. Carnes

Sworn to before me this  
10<sup>th</sup> day of June 2001

2001

IN

SIGHT

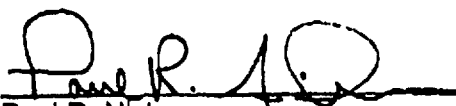
OF

Notary Public

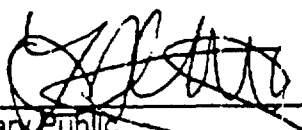
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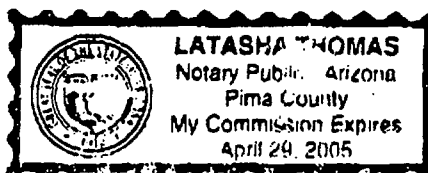
- 8 -

20. (PRN) I hereby certify that the foregoing statements in paragraphs 1(b), 2, 3 and 8-12 above are true and correct to the best of my knowledge, information, and belief.

  
Paul R. Nickens

Sworn to before me this  
27th day of June 2001

  
Notary Public

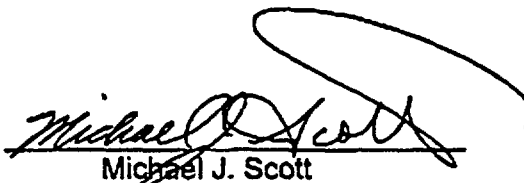


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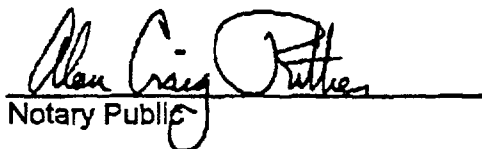


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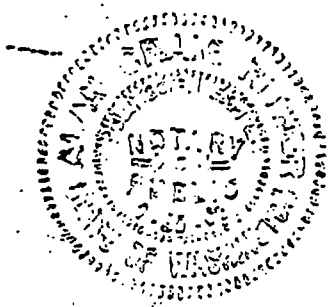
21. (MJS) I hereby certify that the foregoing statements in paragraphs 1(c), 2, 3, and 13-18 above are true and correct to the best of my knowledge, information, and belief.

  
Michael J. Scott

Sworn to before me this  
27 th day of June 2001

  
Notary Public

My Commission expires: 1/30/05



**BASIS 1 AFFIDAVIT, ATTACHMENT 1**

## **Sam A. Carnes**

### **EDUCATION**

**Ph.D. in Political Science.** Northwestern University, Evanston, IL 1978.

**M.A. in Political Science.** University of New Mexico, Albuquerque, NM, 1970.

**B.A. in Chemistry, *Cum Laude* in General Studies.** University of New Mexico, 1968.

### **EXPERIENCE**

#### **Research Staff**

**June 1978 - present**

OAK RIDGE NATIONAL LABORATORY  
OAK RIDGE, TN

At Oak Ridge National Laboratory, I have performed (a) social impact assessments involving the nuclear fuel cycle, synthetic fuels, and hazardous and radioactive waste management, and (b) analysis of local, state, national, and international policies related to hazardous and radioactive waste management and transportation. These analyses have included the role of incentives in nuclear waste repository siting and community-based assessments of conservation and renewable energy technologies and community energy planning. I have also provided expert testimony at relevant administrative board hearings and public hearings. Assignments for the different positions I have held at Oak Ridge are described below.

*Center for Energy and Environmental Analysis, Energy Division*  
Oak Ridge National Laboratory (1997--present)

Assignments have included project leadership for environmental impact statements for the Program Manager for Chemical Demilitarization for destruction of the chemical weapons inventories at two Army storage installations (Newport Chemical Depot in Indiana and Blue Grass Army Depot in Kentucky), and assessment of socioeconomic impacts for a clean coal project for the U.S. Department of Energy (Utah).

*Human Systems and Technology Group, Environmental Analysis and Assessment Section, Energy Division, Oak Ridge National Laboratory (1993-1997)*

In addition to leading this organizational unit, assignments included leading the development of performance measures for evaluating public involvement programs for the U.S. Department of Energy's environmental restoration and waste management activities (for the Office of Environmental Management) and applying those measures in selected applications; analyzing basic factors critical to the success of public involvement in policy-making; identifying basic dimensions of environmental justice analyses; and developing decision-making strategies for waste management for the U.S. Department of Energy complex. Assignments also included re-evaluating risk analyses and consequent emergency preparedness

plans for the Army's chemical storage sites and preparing a framework for implementing phase 2 of the National Acid Precipitation Assessment Program.

*Hazard Management Group, Integrated Analysis and Assessment Section, Energy Division, Oak Ridge National Laboratory (1981-1993)*

Assignments included serving as leader of this research group for two periods (1981-87 and 1992-1993), and leading assignments related to the development of health and environmental impact analyses for the U.S. Army's Program Manager for Chemical Demilitarization for the disposal of chemical munitions (1984-1987) and site-specific emergency response concept plans for the Army's eight chemical stockpile storage installations (1987-1989). Related to these efforts, I also participated in multi-laboratory efforts to analyze the policy and institutional issues potentially affecting verification of a global ban on chemical weapons (1989-1991). Assignments also included evaluating the environmental, safety and health protection programs for safety analyses of the Y-12 nuclear weapons plant and gaseous diffusion plants. I also participated in research examining the psychological and community well-being impacts of restarting Three Mile Island Unit One for the U.S. Nuclear Regulatory Commission and provided expert testimony regarding social impacts of Indian Point nuclear power plant in New York. In addition, I participated in or led research efforts related to the transportation of hazardous and radioactive materials (for the U.S. Army's Program Manager for Chemical Demilitarization and the U.S. Department of Energy) and the potential utility of incentive systems for siting hazardous facilities (for the U.S. Department of Energy).

*Social Impacts Analysis Group, Regional and Urban Studies Section, Energy Division, Oak Ridge National Laboratory (1978-1981)*

Assignments included serving as a research associate and assessing the socioeconomic impacts of nuclear and fossil-fuel power systems, analyzing the implications of hazardous waste management laws for the U.S. Department of Energy, and developing and evaluating community-based assessments of decentralized energy systems (for the U.S. Department of Energy).

**Visiting Assistant Professor**  
Department of Political Science  
Purdue University  
West Lafayette, IN

**August 1977 - June 1978**

I developed and taught courses in American government, urban policy, and environmental policy analysis.

Sam A. Carnes

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**Research Associate**  
Center for Urban Affairs  
Northwestern University  
Evanston, IL

**June 1976 - July 1977**

I researched the political, social and economic impacts of centralized and decentralized energy-generating facilities upon various jurisdictions.

**Assistant Professor**  
Department of Political Science  
Western Illinois University  
Macomb, Illinois

**August 1975 - June 1976**

I developed and taught courses in American government, municipal government, and rural community development.

#### **OTHER QUALIFICATIONS AND AWARDS**

**Distinguished Technical Report**, East Tennessee Chapter of the Society for Technical Communication, February, 1991

**Significant Event Award**, Oak Ridge National Laboratory, June, 1988 (preparation of Final Programmatic Environmental Impact Statement for the Army's Chemical Stockpile Disposal Program)

**Significant Event Award**, Oak Ridge National Laboratory, November, 1986 (preparation of Draft Programmatic Environmental Impact Statement for the Army's Chemical Stockpile Disposal Program)

#### **PUBLICATIONS**

During my career at Oak Ridge National Laboratory, I have authored or co-authored over 75 professional reports and publications. A listing of publications is available on request. Selected publications include:

S. A. Carnes, M. Schweitzer, E. B. Peelle, A. K. Wolfe, and J. F. Munro, 1998. "Measuring the success of public participation on environmental restoration and waste management activities in the U.S. Department of Energy," *Technology and Society*, 20:385-406.

S. A. Carnes and R. M. Reed, 1998. "Lessons learned and new challenges for integrated assessment under the National Environmental Policy Act," in *Multiple Objective Decision Making for Land, Water, and Environmental Management*, S. A. El-Swaify and D.S. Yakowitz, eds., St. Lucie Press.

S. A. Carnes, 1995. "The plethora of publics and their participation in policy making: how can they properly participate?" pp. 204-213 in *Environmental Challenges: The Next 20 Years, NAEP 20th Annual Conference Proceedings*, Washington, D.C.: National Association of Environmental Professionals.

S. A. Carnes and A. K. Wolfe, 1995. "Research and institutional dimensions of environmental justice: implications for NEPA documentation," pp. 286-291, in *Environmental Challenges: The Next 20 Years, NAEP 20th Annual Conference Proceedings*, Washington, D.C.: National Association of Environmental Professionals.

S. A. Carnes, 1994. "Negotiating equity for management of DOE wastes," *Proceedings of the 5th Annual International High-Level Radioactive Waste Management Conference*, Las Vegas, Nevada, May 22-26, 1994, pp. 1-8.

S. A. Carnes, 1993. "The people problems of NEPA: social impact assessment and the role of public involvement," for *ORNL Life Sciences Symposium*, S. Hildebrand and J.B. Cannon, eds. (Lewis Publishing).

S. A. Carnes, ed., 1989. "Integrated environmental assessment for a major project," *The Environmental Professional*, 11: 277-446.

S. A. Carnes (project leader), 1987. *Chemical Stockpile Disposal Program Final Programmatic Environmental Impact Statement*, for U.S. Department of the Army, Program Executive Office Program Manager for Chemical Demilitarization, December, 1987.

John Sorensen, Jon Soderstrom, et al. 1987. *Impacts of Hazardous Technology: The Psycho-Social Effects of Restarting TMI-1* (Albany: State University of New York Press, 1987).

R. B. Braid, M. Schweitzer, et al., 1985. "The importance of cumulative impacts for socioeconomic impact assessment and mitigation," *Energy*, 10: 643-652.

M. Schweitzer, S. A. Carnes, et al., 1983. "Synthetic fuel development: potential socioeconomic impacts associated with single and multiple projects," *Energy Policy*, 11: 333-345.

Department of Energy, *Draft Environmental Impact Statement, Solvent Refined Coal-I, Demonstration Project, Newman Daviess County, Kentucky*, DOE/EIS-0073-D/VI, (socioeconomic and cumulative impacts sections, with others), January, 1981.

B. H. Bronfman, S. A. Carnes, and R. B. Braid, Jr., 1980. "Assessments of alternative sites in the EIS process: a socioeconomic analysis perspective," in *EIS Annual Review*, Gene Allen, ed., Information Resources Press.

S. A. Carnes, 1978. *Rural Community Change: A Study of the Preliminary Impacts of New National Parks on Peripheral Cities and Villages* (Evanston, IL: Northwestern University, Ph.D., dissertation).

**BASIS 1 AFFIDAVIT, ATTACHMENT 2**

## **Paul R. Nickens**

### **EDUCATION**

**Ph.D., Anthropology, University of Colorado, 1977**

**M.A., Anthropology, University of Colorado, 1974**

**B.A., Anthropology, University of Colorado, 1969**

### **EXPERIENCE**

#### **Senior Research Scientist**

**March 1994-present**

Pacific Northwest National Laboratory (PNNL)  
Richland, Washington

Duties include primary data gathering activities involving cultural resources field inventories, resource evaluation, conduct of mitigation activities to reduce the effects of project activities on cultural resources, and preparation of Environmental Impact Statements (EISs) and Environmental Assessment (EAs) documenting this work. EIS and EA preparation has also included preparation of cultural resources, affected environment, and environmental consequences sections, along with consultation involvement with several American Indian Tribes for traditional cultural properties and related issues.

Duties included analysis of impacts on cultural resources for the following specific projects: (a) Environmental Impact Statement for the Sonora-Arizona Interconnection Project, Southern Arizona. U.S. Department of Energy and Public Service Company of New Mexico (in progress); (b) Yucca Mountain Nuclear Waste Repository, NV, Environmental Impact Statement. U.S. Department of Energy, Nevada Operations Office, Las Vegas, NV (in progress); (c) Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities. U.S. Nuclear Regulatory Commission, Washington, D.C. (in progress); (d) Hatch Nuclear Plant, GA, License Renewal Environmental Impact Statement, NUREG-1437, Supp. 4. U.S. Nuclear Regulatory Commission, Washington, D.C. (2001); (e) Arkansas Nuclear One Nuclear Station, AR, License Renewal Environmental Impact Statement, NUREG-1437, Supp. 3. U.S. Nuclear Regulatory Commission, Washington, D.C. (2000); (f) Oconee Nuclear Station, SC, License Renewal Environmental Impact Statement, NUREG-1437, Supp. 2. U.S. Nuclear Regulatory Commission, Washington, D.C. (1999); (g) Calvert Cliffs Nuclear Power Plant, MD, License Renewal Environmental Impact Statement, NUREG-1437, Supp. 1. U.S. Nuclear Regulatory Commission, Washington, D.C. (1999); (g) Standard Review Plan for Environmental Reviews of Nuclear Power Plants: Operating License Renewal, NUREG-1555, Supplement 1. U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. (1998); (h) Standard Review Plan for Environmental Reviews for Nuclear Power Plants, NUREG-1555. U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. (1997).



**Adjunct Research Scientist**

**June 1998-Present**

Bureau of Applied Research in Anthropology  
University of Arizona.

Participate as a member of the adjunct faculty at the University of Arizona, including guest lecturing, offering classes in areas of professional expertise, and providing technical input to other faculty research projects.

**Project Manager**

**March, 1994-October, 1997**

Cultural Resources Program  
U.S. Department of Energy  
Hanford Site

Accountable for setting technical direction, planning, management, and business development for the Hanford Cultural Resources Laboratory and the Hanford Cultural Resources Project, as well as independently developed research projects. Duties include business development, project management, technical, and financial planning, project-driven research, documentation, and external publication.

**Research Scientist**

**November, 1988 - February, 1994**

U.S. Army Engineer Waterways Experiment Station  
Vicksburg, MS

Primary responsibility was as principal investigator for a multi-year, nationwide research work unit involving identifying and evaluating technologies and strategies to protect and preserve cultural resource properties at Corps of Engineers' projects and Department of Defense facilities. Provided technical support to DOD and COE offices throughout the country, as well as for many other federal and state agencies.

**Principal Investigator and Owner**

**January, 1979 - October, 1988**

**Nickens and Associates  
Montrose, Colorado**

Served as principal for a small business offering cultural resource management studies for private clients and governmental agencies throughout the Western United States. Between 1979 and 1988, some 190 major projects located throughout Colorado, Utah, Nevada, Idaho, Wyoming, Nebraska, Kansas, Missouri, New Mexico, and Arizona, Texas, Louisiana, and Mississippi, were completed.

## **PUBLICATIONS**

Author or co-author of over 175 journal articles, books, and reports in the fields of anthropology and archaeology. (List of publications available upon request.) Selected publications include:

2000 Science and Technology in Historic Preservation (co-edited with Ray A. Williamson). Kluwer Academic/Plenum Publishers, New York.

2000 Technologies for In Place Protection and Long Term Conservation of Archaeological Sites. In Science and Technology for Historic Preservation, Edited by Williamson and Nickens, pp. 309-332.

1999 Management and Protection of Archaeological and other Cultural Sites on the Hanford Cultural Landscape. (with Mona K. Wright) In Archaeology in Washington 7: 25-36.

1998 Historic Period Native American Occupation of the Hanford Site, South-central Washington. Pacific Northwest National Laboratory Report, Richland, WA.

1998 Prehistoric and Historic Archaeological Preservation, Protection, and Monitoring Plan, U.S. Department of Energy Hanford Site, Washington. Pacific Northwest National Laboratory Report, Richland, WA.

1998 Tribal Cultural Resource Studies at the Hanford Site, South-central Washington: Proceedings of the Hanford Technical Exchange Program, April 30, 1998 (Editor). Pacific Northwest National Laboratory Report, Richland, WA.

1998 Native American Involvement at the Hanford Site: 1943 to the Present. In Tribal Cultural Resource Studies at the Hanford Site, South-central Washington, pp. 1-16.

1998 Geologic, Geoarchaeologic, and Historical Investigation of the Discovery Site of ancient Remains in Columbia Park, Kennewick, Washington (with five other authors). Technical Report GL-98-13. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

1998 Monitoring Bank Erosion at the Locke Island Archaeological National Register District: Summary of the 1996/1997 Field Activities (Editor and co-author with three others). Pacific Northwest National Laboratory Report PNNL-11970, Richland, WA.

1997 Archaeological Site Revegetation, Organochloride-Based Pesticides, PCBs and Their Relationship to Resource Preservation and Protection (with Robert Thorne and Richard Waldbauer). Report prepared for the National Park Service, National Center for Preservation Technology and Training, Natchitoches, LA.

1997 Building an Erosion Monitoring Approach for Cultural Resources: An Example from the Hanford Reach of the Columbia River (with Natalie Cadoret and Mona Wright). In Making Protection Work: Proceedings of the 9<sup>th</sup> Conference on Research and Resource Management in Parks and on Public Lands, edited by David Harmon, pp. 123-131. George Wright Society, Hancock, MI.

1995 Procedures for Providing Long Term Cultural Site Preservation in the Columbia Basin, (with Lawson Smith and Maureen Corcoran). U.S. Army Engineer Waterways Experiment Station, Geotechnical Laboratory Technical Report, Vicksburg, MS.

1995 Integrated Cultural Resource Management at the Hanford Site, Southeast Washington (with Mona Wright, David Harvey, and Charles Pasternak). In Sustainable Society and Protected Areas: Contributed Papers of the 8<sup>th</sup> Conference on Research and Resource Management in Parks and on Public Lands, edited by Robert Linn, pp. 163-169. George Wright Society, Hancock, MI.

**Paul R. Nickens**

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**1993 Archeological Resources and the Conservation Ethic: Advances in Site Preservation and Long Term Management Goals. In Partners in Stewardship: Proceedings of the 7th Conference on Research and Resource Management in Parks and on Public Lands, edited by W.E. Brown and S.D. Veirs, pp. 418-424. George Wright Society, Hancock, MI.**

**BASIS 1 AFFIDAVIT, ATTACHMENT 3**

## **MICHAEL J. SCOTT**

### **EDUCATION**

**Ph.D., Economics**, University of Washington, 1975

**M.A., Economics**, University of Washington, 1971

**B.A., Economics**, Washington State University, 1970

### **EXPERIENCE**

#### **Staff Scientist**

**January, 1980-present**

Technology Planning and Deployment Group  
Energy Division  
Pacific Northwest National Laboratory

Duties include microeconomic and macroeconomic modeling and analyses of natural resource economics (especially including global change issues), regional economics, and public finance, as applied in a wide variety of projects. Duties have also included direction and participation in numerous benefit-cost studies and evaluations of the regional impacts of large-scale energy development and other types of federal actions. Addition responsibilities have included several projects involving practical problems of state and local governments. Specific projects have included preparing environmental justice sections for environmental impact statements for the K-Basin reactors at the Hanford Site, for four separate sites for Molybdenum-99 production, and for the Watts Bar nuclear power plant site. Other projects included preparing environmental review guidance for the Nuclear Regulatory Commission on socioeconomics and environmental justice (NUREG-1555 and NUREG-1555, Supplement 1); and preparing environmental justice sections of environmental impact statements for the Department of Energy on management of solid wastes at the Hanford site and for the NRC on the Calvert Cliffs, Oconee, Arkansas Nuclear One, Unit No. 1, and Edwin Hatch nuclear power plants.

#### **Assistant Professor**

**September, 1975-December, 1979**

Institute of Social and Economic Research  
University of Alaska

Duties included microeconomic modeling, analyses involving natural resource economics, regional economics, and public finance modeling and analysis, as applied in a wide variety of issues in the state of Alaska. Duties included participation in the development of the University of Alaska's Man in the Arctic (MAP) model, a state-of-the-art regional econometric model containing economic, demographic, and fiscal components. Numerous projects involved use the MAP to analyze long-run fiscal and developmental policies for the State of Alaska. Other projects included analysis of the costs of Trans-Alaska Pipeline system, socioeconomic impacts of numerous other development projects, and developing cost indices and methods to allocate public school foundation program funds to school

districts and administratively determine child support payments for divorced couples in accordance with federal guidelines

## PROFESSIONAL AFFILIATIONS

- American Economic Association
- Western Economic Association
- American Agricultural Economics Association
- Board of Directors, Northwest Regional Economic Conference
- American Geophysical Union

## RELEVANT PUBLICATIONS, PAPERS, AND PRESENTATIONS

U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (Coauthor). 2001. Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants. Supplement 4: Regarding the Edwin E. Hatch Nuclear Plant, Units 1 and 2. NUREG-1437, Supplement 4. U.S. Nuclear Regulatory Commission, Bethesda, Maryland.

U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (Coauthor). 2001. Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants. Supplement 3: Regarding the Arkansas Nuclear One, Unit 1. NUREG-1437, Supplement 3. U.S. Nuclear Regulatory Commission, Bethesda, Maryland

Scott, M.J., S. Gupta, J. Nwafor, E. Jáuregui, D. Satterthwaite, Y.A.D.S. Wanasinghe, T. Wilbanks, M. Yoshino, U. Kelkar. 2001. Human Settlements, Energy, and Industry. In *Climate Change 2001: Impacts, Adaptation, and Vulnerability*. Cambridge University Press, Cambridge, U.K. [In Press].

Scott, M.J. 2001. Implementing Environmental Justice in Environmental Impact Statements. Waste Management 2001 Conference Proceedings, February 28, 2001. PNNL-SA-33699. Pacific Northwest National Laboratory, Richland, Washington.

Scott, M.J., D.J. Hostick, and D.B. Elliott. 2000. Impact of 2001 Building Technology, State and Community Programs on United States Employment and Wage Income. PNNL-13182. Pacific Northwest National Laboratory, Richland, Washington.

Kincaid, C.T. et al. 2000. [Contributor] Groundwater/Vadose Zone Integration Project System Assessment Capability (Revision 0): Assessment Description, Requirements, Software Design, and Test Plan. BHI-01365. Draft A. Bechtel Hanford, Inc., Richland, Washington.

Scott, M.J. 2000. Hanford, Diversification, and the Tri-Cities Economy, FY1999. DOE/RL-2000-32. U.S. Department of Energy, Richland Operations Office, Richland, Washington.

U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (Coauthor). 1999. Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants. Supplement 2: Regarding the Oconee Nuclear Power Station. NUREG-1437, Supplement 2. U.S. Nuclear Regulatory Commission, Bethesda, Maryland.

U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (Coauthor). 1999. Standard Review Plans for Environmental Reviews for Nuclear Power Plants. Supplement 1: Operating License Renewal. NUREG-1555, Supplement 1. U.S. Nuclear Regulatory Commission, Bethesda, Maryland.

U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (Coauthor). 1999. Standard Review Plans for Environmental Reviews for Nuclear Power Plants. NUREG-1555. U.S. Nuclear Regulatory Commission, Bethesda, Maryland.

Kincaid, et al.[Coauthor] 1999. Groundwater/Vadose Zone Integration Project, Preliminary System Assessment Capability Concepts for Architecture, Platform, and Data Management. Letter Report. Bechtel Hanford, Inc., Richland, Washington.

U.S. Nuclear Regulatory Commission, Office of Reactor Regulation [Coauthor]. 1999. Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants. Supplement 1. Calvert Cliffs Nuclear Power Plant. NUREG-1437, Supplement 1. Nuclear Regulatory Commission, Washington, D.C.

Scott, M.J. 1999. Pacific Northwest National Laboratory Community Relations, 1998-99. PNNL-SA-32029. Pacific Northwest National Laboratory, Richland, Washington.

Cort, K.A., P.L. Hendrickson, M.J. Scott, and P.A. Wright. 1999. Evaluation of Site Restoration Alternatives for Washington Nuclear Plants 1&4. PNWD-2468. Battelle, Pacific Northwest Division, Richland, Washington.

Scott, M.J., J. Jaksch, K. Anderson, and C. Stockle. 1999. Value of Improved Climate Forecasting for Irrigated Agriculture. Presented at the 1999 Spring Meeting, American Geophysical Union, June 4, 1999, Boston, Massachusetts. PNNL-SA-31245. Pacific Northwest National Laboratory, Richland, WA.

Scott, M. J., E.J. Stenehjem, and K.A. Cort. 1999. Consequences of Drug Policy at the County Level: The Benton County Jail Assessment. Presented at the 1999 Pacific Northwest Regional Economic Conference, May 7, 1999. PNNL-SA-31236. Pacific Northwest National Laboratory, Richland, Washington.

Scott, M.J. 1999. Hanford, Diversification, and the Tri-Cities Economy, FY1998. DOE/RL-99-29. U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Scott, M.J. 1998. Hanford and the Tri-Cities Economy, FY 1997. DOE-RL-98-29. U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Scott, M.J., D.J. Hostick, and D.B. Belzer. 1998. ImBuild: Impact of Building Energy Efficiency Programs. PNNL-11884. Pacific Northwest National Laboratory, Richland, Washington.

Scott, M.J., Hostick, D.J., D.B. Elliott, R.W. Schultz. 1998. Impact of Building Technology, State and Community Programs on United States Employment and Wage Income. PNNL-11843. Pacific Northwest National Laboratory, Richland, Washington.

U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (Coauthor). 1997. Standard Review Plans for Environmental Reviews for Nuclear Power Plants. NUREG-1555. U.S. Nuclear Regulatory Commission, Bethesda, Maryland.

U. S. Department of Energy, Office of Nuclear Energy, Science and Technology [Contributing Author, Socioeconomics and Environmental Justice]. 1996. Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes DOE/EIS-0249. U.S. Department of Energy, Washington, D.C.

U. S. Department of Energy, Richland Operations Office [Contributing Author, Socioeconomics and Environmental Justice]. 1996. Management of Spent Nuclear Fuel from the K Basins at the Hanford Site, Richland, Washington. DOE/EIS-0245. U.S. Department of Energy, Richland, Washington.

U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation. 1995. [Contributing author-Socioeconomics and Environmental Justice]. Final Environmental Statement Related to the Operation of Watts Bar Nuclear Plant Units 1 and 2. Docket Nos. 50-390 and 50-391, Tennessee Valley Authority. NUREG-0498 Supplement No.1. Nuclear Regulatory Commission, Washington, D.C.

Beck, D.M., M.J. Scott, M.D. Davis, S.F. Shindle, B. A. Napier, A.G. Thurman, D.B. Pittenger, and N.C. Batishko. 1991. Hanford Area 1990 Population and 50-Year Projections. PNL-7803. Pacific Northwest Laboratory, Richland, Washington.

M.J. Scott, et al. 1991. "The Potential Consequences of Atmospheric/Climate Change." IN R.A. Bradley, E.C. Watts, and Edward R. Williams (eds.) Report to the Congress of the United States: Limiting Net Greenhouse Gas Emissions in the United States. DOE/PE-0101. U.S. Department of Energy, Washington, D.C.

Pacific Northwest Laboratory. 1991. [Anonymous Coauthor]. Value of Investing in Science and Technology at Hanford. Prepared for the Office of Environmental Restoration and Waste Management, U.S. Department of Energy, Washington D.C. by Pacific Northwest Laboratory, Richland, Washington.

M.J. Scott and D.B. Belzer. 1991. Tri-Cities Economy Review and Outlook: September 1991 Update. Pacific Northwest Laboratory, Richland, Washington.

M.J. Scott and D.B. Belzer. 1991. Tri-Cities Economy Review and Outlook: March 1991 Update. Pacific Northwest Laboratory, Richland, Washington.

M.J. Scott and D.B. Belzer. 1990. Tri-Cities Economy Review and Outlook: September 1990 Update. Pacific Northwest Laboratory, Richland, Washington.

M.J. Scott, et al. 1990. Tri-Cities Purchasing Behavior. PNL-7382. Tri-City Industrial Development Council, Kennewick, Washington.

M.J. Scott and D.B. Belzer. 1990. Tri-Cities Economy Review and Outlook: March 1990 Update. Pacific Northwest Laboratory, Richland, Washington.

M.J. Scott. 1989. "Global Environmental Change and Socioeconomic Impacts: Estimating Costs to Society." PNL-SA-17494S. Presentation at the Hanford Technical Exchange, Richland, Washington, October 11, 1989.

M.J. Scott and D.B. Belzer. 1989. Tri-Cities Economy Review and Outlook: September 1989 Update. Pacific Northwest Laboratory, Richland, Washington.

M.J. Scott and D.B. Belzer. 1989. The Tri-Cities Economy Review and Outlook: March 1989 Summary. PNL-SA-16604. Pacific Northwest Laboratory, Richland, Washington.

M.J. Scott, et al. 1989. Hanford and the Tri-Cities Economy: Review and Outlook, March 1989. PNL-6813. Pacific Northwest Laboratory, Richland, Washington.

M.J. Scott and S.J. Guthrie. 1988. Secondary Economic Impact of Acid Deposition Control Legislation in Six Coal Producing States. PNL-6669. Pacific Northwest Laboratory, Richland, Washington.

M.J. Scott and D. B. Belzer. 1988. "Hanford, the N Reactor, and Washington's Economy: The Impacts of Permanent Closure." Northwest Environmental Journal, 4(1): 129-155.

Pacific Northwest Laboratory. 1988. [Contributing Author.]



Southeast Alaska Acoustic Measurement Facility (SEAFAC). David Taylor Research Center - Detachment Puget Sound - U.S. Department of the Navy, Silverdale, Washington.

M.J. Scott, et al. 1987. The Economic and Community Impacts of Closing Hanford's N Reactor and Nuclear Materials Production Facilities. PNL-6295. Pacific Northwest Laboratory, Richland, Washington.

P.L. Hendrickson, M.J. Scott, and M.F. Mullen. 1987. "Impact of Proposed Financial Responsibility Requirements for Cleanup of Accidental Releases of Radioactive Materials." Paper presented to the 32nd Annual Meeting of the Health Physics Society, July 8, 1987, Salt Lake City, Utah.

P.L. Hendrickson, M.J. Scott, M.F. Mullen, A.K. Nicholls, and S.A. Smith. 1987. Impact of Proposed Financial Assurance Requirements on Nuclear Materials Licensees. NUREG/CR-4958, PNL-6233. Pacific Northwest Laboratory, Richland, Washington.

M.J. Scott and O.S. Goldsmith. 1987. "Assessing Regional Econometric Models: A Discussion and Application." Annals of Regional Science 21 (1): 1-35.

Leistritz, F. L., R. A. Chase, B. L. Ekstrom, G. Knapp, L. Huskey, S. H. Murdock, M. J. Scott. 1986. "Challenge to Socio-Economic Impact Modelling: Lessons from the Alaska OCS Program." Journal of Environmental Management. 21:301-319.

U.S. Department of Energy. 1986. [Contributing Author]. Nuclear Waste Policy Act: Monitored Retrievable Storage Submission to Congress. Volume 2. Environmental Assessment for a Monitored Retrievable Storage Facility. DOE/RW-0035. U.S. Department of Energy, Washington, D.C.

Scott, M. J. 1985. Analysis of Past Outer Continental Shelf Oil and Gas Studies, U. S. Minerals Management Service, Alaska Outer Continental Shelf Office.

Callaway, J. M., et al. 1984. (Co-author) Preliminary Benefit-Cost Analysis of The Fast-Flux Test Facility (FFTF) Power Addition. PNL-5206, Pacific Northwest Laboratory, Richland, Washington.

Moe, R. J., R. C. Adams, and M. J. Scott. 1984. "A Forecast Model of Regional Economic Activity." In Analytic Techniques for Energy Planning, B. Lev, et al., eds. Elsevier Science Publishers B. V. (North-Holland), Amsterdam.

Kresge, D. T., et al. 1984. (Co-author) Regions and Resources: Strategies for Development. MIT Press, Cambridge, Massachusetts.

Adams, R. C. et al. 1983. (Co-author) The Metropolitan and State Economic Regions (MASTER) Model-Model Documentation. PNL-4698. Pacific Northwest Laboratory, Richland, Washington.

Adams, R. C., R. J. Moe, and M. J. Scott. 1983. The Metropolitan and State Economic Regions (MASTER) Model - Overview. PNL-4749. Pacific Northwest Laboratory, Richland, Washington.

Moe, R. J., R. C. Adams, and M. J. Scott. 1983. Regional Impacts of Increasing Energy Prices. Paper presented at the Western Economic Association 58th Annual Conference, Seattle, Washington, July 20-24, 1983.

Scott, M. J., "Shortcut Disaggregation of Regional Model Results: A Test of Time Series Cross Section Analysis." Northeast Regional Science Review, 10, May 1980.

Scott, M. J. Southcentral Alaska's Economy and Population, 1965-2025: A Base Study and Projection. Final Report of the Economics Task Force, Southcentral Alaska Water Resources Study (Level B) to the Alaska Water Study Committee. University of Alaska Institute of Social and Economic Research, January 31, 1979.

Goldsmith, O. S., E. L. Gorsuch, T. L. Huskey, M. J. Scott, and A. R. Tussing. The Permanent Fund and the Growth of the Alaskan Economy: Selected Studies. A report for the House Special Committee on the Alaska Permanent Fund. University of Alaska Institute, of Social and Economic Research, January, 1978.

Scott, M. J., "Analysis of the Costs of Delay in the Trans-Alaska Pipeline Project." Appendix to T. Morehouse, et al., Fish and Wildlife Protection in the Planning and Construction of the Trans-Alaska Oil Pipeline. U.S. Department of Interior, Fish and Wildlife Service. FWS/OBS-78/70. Washington, D.C. Government Printing Office, October, 1978.

Scott, M. J., "Behavioral Aspects of the State of Alaska's Operating Budget FY 1970-FY 1977." An Analysis Funded by the Legislative Affairs Agency, Alaska State Legislature and National Science Foundation Man in the Arctic Program, March 31, 1978.

Scott, M. J., "Fiscal Consequences of Energy Resource Development: Planning for Government Services in Alaska." Man in the Arctic Program Working Paper. Presented at the Western Economic Association 53rd Annual Meeting, Honolulu, Hawaii, June 22, 1978.

Scott, M. J., "Estimating Economies of Scale in Alaskan Industries." A paper presented to the Symposium on Economic Modeling in Alaska. Anchorage, Alaska, October 20-21, 1978.

Scott, M. J. and L. E. Leask, "Prices and Incomes--Alaska and the U.S.", Alaska Review of Social and Economic Conditions, 15(3), December 1978.

Scott, M. J., Alaska Interregional Cost Differentials. Center for Northern Education Research, University of Alaska, 1977.

Scott, M. J., Practical Issues in Long-Term Fiscal Planning for Alaska. Prepared contract to the State of Alaska Division of Policy Development and Planning. University of Alaska Institute of Social and Economic Research, April 1977.

Scott, M. J., "The Growth Consequences of Alternative Mineral Lands Leasing Policies." Paper presented at the Western Economic Association 52nd Annual Meeting, Anaheim, California, June 20, 1977.

Goldsmith, O. S., J. A. Kruse, C. L. Logsdon, and M. J. Scott, A Preliminary Overview of the Economic and Social Effects of the Proposed Northwest Gas Pipeline on Alaska. Contract to Gulf Interstate, Inc., Houston, Texas, University of Alaska Institute of Social and Economic Research, June 18, 1976.

Scott, M. J., "Some Aspects of the Economic Impact of OCS Development in Alaska," Science in Alaska 1976. Proceedings of the 27th Alaska Science Conference, August 4-7, 1976. Alaska Division, American Association for the Advancement of Science, 1976.

Scott, M. J., Analysis of Economic and Social Impact of Alternative Routes to the Alaska Arctic Gas Pipeline: An Economic Analysis. Prepared for the U.S. Department Interior, Bureau of Land Management, Alaska Natural Gas Transportation System Task Force. Contract YA-512-CT6-68, December, 1975.