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 MARTHA S. SALK AND CLAY E. EASTERLY
CONCERNING UTAH CONTENTION DD

Martha S. Salk ("MSS") and Clay E. Easterly ("CEE"), being duly sworn, do hereby state as follows:[1]

1(a). (MSS) My name is Martha S. Salk. I am employed as a member of the research staff in the Environmental Sciences Division 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 ("NRC Staff") and ORNL. A statement of my professional qualifications is attached hereto as Attachment 1.

1(b). (CEE) My name is Clay E. Easterly. I am employed as a member of the research staff in the Life Sciences Division at Oak Ridge National Laboratory ("ORNL") in Oak Ridge, Tennessee. I am providing this affidavit under a technical assistance contract between the NRC Staff and ORNL. A statement of my professional qualifications is attached hereto as Attachment 2.

2. (CEE, MSS) This Affidavit is prepared in support of the "NRC Staff's Response To Applicant's Motion For Summary Disposition of Utah Contention DD — Ecology and Species" ("Staff Response") filed herewith, concerning the "Applicant's Motion For Summary Disposition of Utah Contention DD — Ecology and Species" ("Motion") and the "Statement of Material Facts on

[1] Each individual paragraph as to which an affiant is attesting herein is identified by parenthetically listing the affiant's initials after the paragraph number.

Which No Genuine Dispute Exists" ("Statement of Material Facts") attached thereto, filed by Private Fuel Storage, L.L.C. ("PFS" or "Applicant") on June 29, 2001. The statements of material fact set forth by the Applicant with respect to Utah Contention DD are addressed herein as follows: Statement numbers 5-30, 33-59, 64-65, 67-68, 70 and 72 (Martha S. Salk), and statement numbers 31-34, 59-63, and 66-72 (Clay E. Easterly).

3. (CEE, MSS) 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.

4. (CEE, MSS) As part of our official responsibilities, we reviewed the Applicant's Motion and the Statement of Material Facts attached thereto, in which PFS seeks summary disposition of Utah Contention DD. Our review included the Declarations of Robert J. Hoffman, Ronald J. Kass, Clyde L. Pritchett, Clayton M. White, the Deposition of Frank P. Howe, each of which were attached to the Applicant's Motion, and certain other information that was not available to the Staff when the DEIS was prepared (*e.g.*, Intermountain Ecosystems, L.L.C., "Private Fuel Storage Facility, Proposed Alternate Rail Route, Plant Species of Special Concern Inventory, Skull Valley Utah," May 12, 1999 (1999 Kass Report); and correspondence from Clyde Pritchett to PFS in May 2001, concerning recent pocket gopher surveys).

5. (MSS) 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 ecological

impact sections of the DEIS and the FEIS. As relevant to Contention Utah DD, these portions of the Statement of Material Facts are Statement Nos. 5-30, 33-59, 64-65, 67-68, 70, and 72.

6. (CEE) 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 health physics for the DEIS and the FEIS. As relevant to Utah Contention DD, these portions of the Statement of Material Facts are Statement Nos. 31-34, 59-63, and 66-72.

7. (CEE, MSS) On the basis of our review of the Applicant's Environmental Report ("ER"), the Applicant's Motion, the Declarations of Mr. Hoffman, Mr. Pritchett, Mr. White, and Mr. Kass, and the Deposition of Mr. Howe, and the DEIS, we are satisfied that the Applicant's Statement of Material Facts is correct, except to the extent set forth below.[2]

8. (MSS) Material Fact No. 7 should be modified to read:

> 7. There is ~~significant~~ considerable vehicular traffic and human foot traffic at the Cargill salt processing plant located at Timpie Springs. White Dec. ¶¶ 28, 30.

9. (MSS) Material Fact No. 21 should be modified to read:

> 21. The largest concentrations of suitable peregrine prey species are in the immediate Timpie Springs WMA wetlands habitat. This is in the opposite direction of Timpie than ~~from~~ the proposed ITP site, *i.e.*, the Timpie Springs WMA lies to the east of Timpie. White Dec. ¶¶ 36-37.

10. (MSS) Material Fact No. 23 should be modified to read:

> 23. The habitat at the proposed ITP consists of cold desert shrub-steppe. This habitat is only marginally ~~suitable for some~~ used by species upon which the peregrines are likely to prey. Furthermore, the proposed ITP consists of only a small percentage of the area within a 10-mile radius of the nesting tower (which constitutes the peregrines' primary foraging area). Also, there is more abundant prey available in wetlands ~~peregrine prey species~~

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[2] In the following discussion, proposed changes to the Applicant's Statement of Material Facts are indicated by underlining (insertions) or underlining and strikeout (deletions).

~~which . These species generally will not be attractive to Timpie Springs WMA peregrine falcons who have more attractive prey concentrations~~ closer to the nesting tower. White Dec. ¶¶ 41-43.

11. (MSS) Material Fact No. 24 should be modified to read:

24. The habitat at the proposed PFSF ~~consists of habitat~~ is suitable for species such as the horned lark, Western meadowlark, sage thrasher, and lark sparrow. These species generally do not nest in adequate densities to be attractive to Timpie Springs WMA peregrine falcons who have more attractive prey concentrations closer to the nesting tower. White Dec. ¶¶ 46, 49, 51-52.

12. (MSS) Material Fact No. 25 should be modified to read:

25. The habitat along the proposed rail corridor consists of ~~consists of~~ cold desert shrub-steppe. This habitat is only marginally ~~suitable for some~~ used by species upon which the peregrines are likely to prey. Furthermore, the rail corridor is outside the peregrines' (10-mile radius) primary foraging area, and there is more abundant prey available in wetlands ~~peregrine prey species. These species generally will not be attractive to Timpie Springs WMA peregrine falcons who have more attractive prey concentrations~~ closer to the nesting tower. White Dec. ¶¶ 41-44.

13. (MSS) Material Fact No. 26 should be modified to read:

26. The distance of approximately 25 miles between the PFSF and the nesting tower at the Timpie Springs WMA makes it very unlikely that a Timpie Springs WMA based falcon would forage regularly near the PFSF site. White Dec. ¶¶ 46-52.

14. (MSS) Material Fact No. 27 should be modified to read:

27. The distance of ~~20 miles between the north end~~ more than 10 miles between the closest approach of the proposed rail corridor and the nesting tower at the Timpie Springs WMA, combined with the small amount of prey makes it very unlikely that a Timpie Springs WMA based falcon would forage regularly along the rail corridor. White Dec. ¶¶ 31, 41-44.

15. (MSS) Material Fact No. 30 should be modified to read:

30. The loss of habitat along the proposed rail corridor from wildfire or ~~construciton~~ construction would have no significant impact on Timpie Springs WMA peregrine falcons' prey base. White Dec. ¶ 44.

16. (CEE) Material Fact No. 31 should be modified to read:

31. Assuming that peregrine falcon prey species at the proposed PFSF spend an entire half-year in contact with the storage casks, they would receive a maximum radiation dose of approximately 61.3 rem per year. Hoffman Dec. ¶ 15.

17. (MSS) Material Fact No. 40 should be modified to read:

40. Any gophers from the four affected burrows along the access road may or may not ~~will~~ be relocated into nearby suitable habitat, but in any event, there would be no adverse impact on the overall population of Skull Valley Pocket Gophers.. Pritchett Dec. ¶¶ 37, 39.

18. (MSS) Material Fact No. 43 should be modified to read:

43. Any gophers from the seven affected burrows along the proposed rail corridor may or may not ~~will~~ be relocated into nearby suitable habitat, but in any event, there would be no adverse impact on the overall population of Skull Valley Pocket Gophers.. Pritchett Dec. ¶¶ 37, 39.

19. (MSS) Material Fact No. 53 should be modified to read:

53. Suitable habitat that does exist for Pohl's milkvetch ~~that does exist~~ is dominated by invasive annuals. Kass Dec. ¶¶ 8,16

20. (CEE) Material Fact No. 60 should be modified to read:

60. A domestic range animal or domestic plant that was located at that closest point would receive a maximum radiation dose of approximately 9.20 mrem per year. Hoffman Dec. ¶¶ 10, 19.

21. (CEE) Material Fact No. 63 should be modified to read:

> 63. Because the dose from the storage casks at the PFS boundary fence is relatively low (by comparison, the dose from the casks is about an order of magnitude below natural background radiation), it is very unlikely that any ~~No~~ ill-effect would accrue to humans that consumed any agricultural products produced by or from domestic plants and animals exposed to the maximum radiation doses at the perimeter of the PFSF OCA. Hoffman Dec. ¶ 22.

22. (CEE) Material Fact No. 66 should be modified to read:

> 66. Even assuming that a bee would spend an entire half-year in contact with storage casks, the maximum radiation dose the bee would receive would be approximately 61.3 rem per year. Hoffman Dec. ¶¶ 6, 15, 21.

23. (CEE) Material Fact No. 71 should be modified to read:

> 71. Assuming an animal is exposed to a maximum radiation dose of approximately 61.3 rem per year at the air inlet duct of a storage cask, it is unlikely that any significant ~~no~~ "genetic" or inheritable effect of that exposure would occur as a result of that exposure. Hoffman Dec. ¶ 22.

24. (CEE, MSS) Notwithstanding the modifications and corrections set forth in paragraphs 8-23 above, we agree with the Applicant's view that the proposed PFSF would not have an adverse effect on the ecological resources and species in Skull Valley.

25. (CEE, MSS) In addition, notwithstanding the modifications and corrections set forth above, we agree with the Applicant's view that the concerns raised by the State of Utah in Contention Utah DD regarding effects on ecological resources and species have been addressed satisfactorily, and no genuine dispute of material fact exists with respect to these matters.

26. (MSS) I hereby certify that the foregoing statements in paragraphs 1(a), 2-5, 7-15, 17-19, and 24-25 above are true and correct to the best of my knowledge, information, and belief.

Martha S. Salk

Martha S. Salk

Sworn to before me this
19th day of July 2001

Melissa O. Byrd

Notary Public

My commission expires: 12-15-04

27. (CEE) I hereby certify that the foregoing statements in paragraphs 1(b), 2-4, 6-7, 16, and 20-25 above are true and correct to the best of my knowledge, information, and belief.

Clay E Easterly

Clay E. Easterly

Sworn to before me this
19th day of July 2001

Marilyn Hazelton

Notary Public

My commission expires:

MARILYN HAZELTON
Notary Public
Commonwealth of Massachusetts
My Commission Expires
July 19, 2007

Attachment 1

Martha S. Salk

EDUCATION

Ph.D. in Plant Ecology, University of Louisville, Louisville, KY, 1975.

M.S. in Plant Ecology, University of Iowa, Iowa City, IA, 1969.

B.A. in Biology (minor in mathematics), Albion College, Albion, Mi, 1967. (Summa cum laude, departmental honors in biology)

EXPERIENCE

1985 to present, Research Staff Member (Part-time), Environmental Analyses Section, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN

1977 to 1984, Research Associate (Part-time), Environmental Analyses Section, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN

1975 to 1977, Research Associate (Full-time), Ecological Analyses and Applications Program, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN

1974 to 1975, Ecologist with Gilbert/Commonwealth Associates, Inc., Reading, PA. January 1973 to May 1973, Teacher, general biology, Jefferson Community College, Louisville, KY

August 1971 to May 1972, Teaching assistant, general biology, University of Louisville, Louisville, KY

September 1969 to May 1970, Teacher, Department of Biology, Dutchess Community College, Poughkeepsie, NY

QUALIFICATIONS:

For DOE's Office of Environmental Policy and Assistance and its predecessors: Principal investigator since 1995 for Environmental Sciences Division assistance to the office. Supervised production of numerous projects related to environmental laws and regulations. Prepared analyses and interpretive guidance on various topics (e.g., proposed regulations and recent laws). For DOE's Office of NEPA Policy and Assistance and its predecessors: Reviewed and commented on numerous NEPA documents (EAs, FONSIs, EISs, RODs). Coordinator of and major participant in revision of DOE's NEPA Compliance Guide. Provided technical assistance by reviewing and providing comments on numerous documents (e.g., EAs, FONSIs, EISs, and supplemental NEPA guidance prepared by DOE Operations Offices). Assisted with planning and presenting the NEPA day of DOE's Environmental Laws and Regulations Course. Prepared internal report on "NEPA compliance by other federal agencies." Others: Projects related to coal, nuclear, and biomass as energy sources. Projects related to energy policy.

SELECTED PUBLICATIONS/PRESENTATIONS

Cushman, R. M., D. B. Hunsaker, Jr., M. S. Salk, and R. M. Reed, "Global climate change and NEPA analyses," pp. 442-463 in S. G. Hildebrand and J. B. Cannon, eds., *Environmental Analysis: The NEPA Experience*, 1993.

Salk, M. S., "Overview of NEPA." "NEPA Compliance Planning." "Preparing NEPA Documentation." "Special Topics in the NEPA Process: Integrating Other Environmental Laws into NEPA Reviews," presented as part of DOE's ongoing Environmental Laws and Regulations Course. Also presented at Oak Ridge National Laboratory.

Salk, M. S., and L. N. McCold. "NEPA and the Endangered Species Act: Complementary approaches or regulatory excess?," presented at the National Association of Environmental Professionals' Annual Conference, Baltimore, MD., April 29–May 2, 1991.

Socolof, M. L., M. S. Salk, A. H. Curtis, L. K. Mann, V. R. Tolbert, and T. J. Blasing, *Environmental data and analyses for the proposed management of spent nuclear fuel on the DOE Oak Ridge Reservation, Data package to support the preparation of an Environmental Assessment*, ORNL/TM-13065, 1995.

Salk, M. S. [preparer (ORNL)], *Guidance Manual for Department of Energy Compliance with the Endangered Species Act.* (Second Edition of DOE/EP-0058, M. S. Salk, R. M. Reed, and C. D. Powers 1982). DOE/EP-0058/1, U.S. Department of Energy, Office of Environmental Compliance, Washington, DC, 1983.

Sharples, F. E. and M. S. Salk [preparers (ORNL)], *Guidance Manual for Department of Energy Compliance with the National Historic Preservation Act.* DOE/EP-0098. U.S. Department of Energy, Office of Environmental Compliance, Washington, DC, 1983.

Sharples, F. E., and M. S. Salk, *The American Indian Religious Freedom Act: Guidance for compliance by federal agencies.* First Revision. ORNL/6166/R1, 1988.

CONTRIBUTIONS TO PUBLICATIONS

U. S. Nuclear Regulatory Commission, *Final Environmental Statement related to construction of Wolf Creek Generating Station Unit 1*, NUREG-75/096, Terrestrial Ecology Sections, 1975.

U.S. Nuclear Regulatory Commission, *Draft Environmental Statement related to construction of Greene County Nuclear Power Plant.* NUREG-0045, Terrestrial Ecology Sections, 1976.

U.S. Nuclear Regulatory Commission, *Final Environmental Statement related to construction of Sterling Power Project Unit 1.* NUREG-0075, Terrestrial Ecology Sections, 1976.

U.S. Department of Energy, *Environmental Assessment. Underground Coal Gasification. Clean Fuels Proof-of-Concept Project.* DOE/EA-0342, Terrestrial Ecology Sections, 1988.

U.S. Department of Energy, *Programmatic Environmental Impact Analysis (PEIA). Innovative Clean Coal Technology Program.* DOE/PEIA-0002, Terrestrial Ecology Sections, 1988.

U.S. Department of Energy, *Environmental Assessment. Innovative Clean Coal Technology Program. Coke Oven Gas Cleaning Demonstration Project.* DOE/EA-0404, Terrestrial Ecology Sections, 1989.

U.S. Department of Energy, *Environmental Assessment. Innovative Clean Coal Technology program. Circulating Fluidized Bed Boiler Repowering Demonstration Project.* DOE/EA-0415, Terrestrial Ecology Sections, 1989.

U.S. Department of Energy, *Programmatic Environmental Impact Statement (PEIS). Clean Coal Technology Demonstration Program.* DOE/EIS-0146, Terrestrial Ecology Sections, 1989.

U.S. Department of Energy, *Environmental Assessment. Innovative Clean Coal Technology program. Advance Flue Gas Desulfurization Demonstration Project.* DOE/EA-0420, Terrestrial Ecology Sections, 1990.

U.S. Department of Energy, *Environmental Assessment. Lease of Parcel ED-1 of the Oak Ridge Reservation by the East Tennessee Economic Council.* DOE/EA-1113, Terrestrial Ecology Sections, 1996.

Federal Energy Regulatory Commission, *Preliminary Draft Environmental Impact Statement. Missouri-Madison Hydroelectric Project (FERC No. 2188), Montana*, Terrestrial Ecology Sections, 1996.

HONORS AND AWARDS

Phi Beta Kappa, Albion College

Dean's Award for Excellence in Graduate Work, University of Louisville

Award of Excellence, Handbook Category, from the East Tennessee chapter of the Society for Technical Communication and from the International Technical Communications Conference. For: Salk and DeCicco, ed., *Environmental Monitoring Handbook for Coal Conversion Facilities* (1979).

Award for Achievement, Whole Periodicals Category, from the East Tennessee chapter of the Society for Technical Communication. For: *Environmental Regulatory Update Table* (1993)

Attachment 2

Clay E. Easterly

EDUCATION

Ph.D. in Health Physics, 1972, University of Tennessee

B.S., 1967, Mississippi State University

EXPERIENCE

1989 to present, Leader, Health Effects Group, Health Sciences Research Division, Oak Ridge National Laboratory

1973 to 1989, ORNL research staff

1972 to 1973, Post Doctoral Appointment.

QUALIFICATIONS

Multidisciplinary researcher and task leader for characterizing effects of human activity on human health. Published in the following areas: molecular spectroscopy of carcinogens; fusion occupational and public safety; tritium systems and effects of environmental factors on the conversion of tritium gas to tritiated water; public health and demographics; nuclear reactor safety and fuel reprocessing; toxicity of stressed dielectric gases; environmental monitoring; differential impacts to human health from alternate fuel cycles; impacts of extremely low frequency electromagnetic fields on people; effects of noise on humans; the use of in vitro assays to predict outcome of long-term animal cancer studies; development of toxicity equivalent factors; development of alternatives to lethal force in law enforcement and military peacekeeping missions.

SELECTED PUBLICATIONS

Easterly, C. E., C. R. Kerley et al., *Environmental Acceptability of High-Performance Alternatives for Depleted Uranium Penetrators*, ORNL/TM-13286, Oak Ridge National Laboratory, Oak Ridge, TN.

Easterly, C. E., M. C. Wade, et al., *Draft Environmental Impact Statement Decommissioning of the Shieldalloy Metallurgical Corporation Cambridge, Ohio, Facility*, NUREG-1543, Nuclear Regulatory Commission, Washington, DC, 1996.

McCold, L. N., C. E. Easterly, et al., *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Final Report*, NUREG-1437, Nuclear Regulatory Commission, Washington, DC, 1996.

Lombardi, D. A., C. E. Easterly, et al., *Environmental Resources of Selected Areas of Hawaii: Climate, Ambient Air Quality and Noise*, ORNL/TM-12861, Oak Ridge National Laboratory, Oak Ridge, TN, 1995.

Easterly, C. E., "A Perspective on EMF Bioeffects and Risk Assessment", *Bioelectrochemistry and Bioenergetics* **35**, 1-11, 1994.

Easterly, C. E., and P. C. Gailey, "Cell Membrane Potentials Induced During Exposure to EMP Fields", *Electro- and Magnetobiology* **13**(2), 159-166, 1994.

Easterly, C. E., R. Lee, et al., *Estimating Externalities of Coal Fuel Cycles, Report Number 3 on the External Costs and Benefits of Fuel Cycles*, UDI-5119-94, U.S. Department of Energy and the Commission of the European Communities, Published by the Utility Data Institute and the Integrated Resource Planning Report, McGraw-Hill, Inc., 1994.

Easterly, C. E., and L. R. Glass, "Evaluating the Tumorigenic Potency of Polynuclear Aromatic Hydrocarbons", *Environment International* **20**(4), 475-481, 1994.

Zimmerman, G. P., C. E. Easterly, et al., *Final Environmental Impact Statement to Construct and Operate a Facility to Receive, Store, and Dispose of 11e.(2) Byproduct Material Near Clive, Utah*, NUREG-1476, 1993.

Easterly, C. E., and R. C. Duncan, "The Effect of Chronic Environmental Noise on the Rate of Hypertension: A Meta-Analysis", *Environment International* **19**, 359-369, 1993.

Easterly, C. E., "Residential Exposures to Indoor Air Pollutants Could Yield Childhood Leukemia Risk Levels Similar to Those Associated with 60Hz Magnetic Fields", pp. 440-442 in *Electricity and Magnetism in Biology and Medicine*, M. Blank ed., San Francisco Press, Inc., San Francisco, CA., 1993.

Easterly, C. E., and T. D. Jones, "Biotesting Waste Water for Hazard Evaluation", *Water Research* **27**(7), 1145-1152, 1993.

Easterly, C. E. and T. E. Aldrich, "A Meta-Analysis of the Epidemiological Evidence Regarding Human Health Risk Associated with Exposure to Electromagnetic Fields," *ELECTRO- AND MAGNETOBIOLOGY* **11**(2), 127-144, 1992.

Easterly, C. E., and B. A. Owen, "Formaldehyde in Drinking Water: Comparative Hazard Evaluation and an Approach to Regulation," *Regulatory Toxicology and Pharmacology* **11**, 220-236, 1990.

Easterly, C. E., H. Noguchi, and M. R. Bennett, "Conversion of Low-Concentration Tritium Water," *Fusion Technology* **16**(2), 137-142, 1989.

Easterly, C. E., and P. J. Papagiannakopoulos, "Mechanism of HTO Formation in Gaseous Tritium Mixtures," *Int. J. Chem. Kinetics* **14**, 77-90, 1982.

Easterly, C. E., K. E. Shank, and T. W. Oakes, *Congenital Malformation and Fetal Mortality Trends in Counties Surrounding Oak Ridge*, ORNL/TM-5805, December 1979.