

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before Chief Administrative Judge
B. Paul Cotter, Jr., Presiding Officer

Administrative Judge
Thomas D. Murphy, Special Assistant

_____)	
In the Matter of)	
)	
HYDRO RESOURCES, INC.)	Docket No. 40-8968-ML
12750 Merit Drive)	
Suite 1210 LB12)	ASLBP No. 95-706-01-ML
Dallas, TX 75251)	

Affidavit of Klara B. Kelley, Ph.D.

Klara Kelley, being duly sworn, states as follows:

1. My name is Klara Kelley. I am of sound mind and body and competent to make the affidavit. I know the information stated herein from my personal knowledge and from my review of the pertinent documents described herein, except that the information stated as my opinion is my professional opinion.

2. I am a self-employed professional anthropologist and have worked as a consultant in anthropology since 1993. I received a Ph.D. in anthropology from the University of New Mexico in 1977. I also perform archaeological surveys and am familiar with standard archaeological survey methods

as used in the Navajo Nation jurisdiction. Most of my professional work has focussed on Navajo life, culture, history, and archaeology. Since 1977, I have worked continuously as an anthropologist, including 11 years' employment with the Navajo Nation. Since 1973, I have conducted anthropological research in all parts of the Navajo Nation, including the Crownpoint, Church Rock, Pinedale, Mariano Lake, Becenti, Dalton Pass, Little Water, and Smith Lake chapters of the Eastern Navajo Agency. In 1990-1991, as an employee of the Navajo Nation Historic Preservation Department, I helped draft the "Navajo Nation Policy to Protect Traditional Cultural Properties" (January 21, 1991). Throughout my tenure with the Navajo Nation and since then as a consultant, I have routinely applied federal and Navajo Nation cultural resource management standards and guidelines, including preliminary and current versions of Navajo Nation Policy to Protect Traditional Cultural Properties and National Register Bulletin 38. I have also received permits from the Navajo Nation to conduct archaeological surveys in the Navajo Nation jurisdiction. With a Navajo colleague I have written an academically published book on Navajo sacred places and cultural resource management. I have previously qualified as an expert on Navajo culture in a federal court. Details of this experience are given in the attached vita (Exhibit A).

3. The purpose of this affidavit is to state my professional opinion of the cultural resources review conducted to date by Hydro Resources Inc. (HRI) for the Nuclear Regulatory Commission's licensing of HRI's proposed Crownpoint Uranium Solution Mining Project. By cultural resources, I mean archaeological sites; historic buildings and other locations associated with important historical events and persons; and traditional cultural properties (which include certain archaeological sites, features of the natural landscape, and currently used facilities), regardless of whether these resources have been determined eligible for National or State Registers of Historic Places. My evaluation has focussed on HRI's cultural resources review for Navajo cultural resources. In my professional opinion, HRI's cultural resources documentation is, first, an inadequate and incomplete basis for determining how the project, and licensing it, may affect significant cultural resources according to applicable federal and Navajo Nation laws, regulations, and policies. These laws and policies include Section 106 of the National Historic Preservation Act (as amended), the Navajo Nation Cultural Resources Protection Act of 1988, National Register Bulletin 38, the Navajo Nation Policy to Protect Traditional Cultural Properties, and Advisory Council on Historic Preservation regulations at 36 CFR Part 800. Second, the documentation

is fragmented and internally inconsistent.

4. I have reviewed the cultural resources portions of the "Final Environmental Impact Statement to Construct and Operate the Crownpoint Uranium Solution Mining Project, Crownpoint, New Mexico," Docket No. 40-8968, Hydro Resources, Inc., prepared by the U.S. Nuclear Regulatory Commission in cooperation with U.S. Bureaus of Land Management and Indian Affairs, dated February 1997. I have also reviewed supporting cultural resources documentation (see "Works Consulted," Exhibit B).

5. HRI's cultural resources documentation consists of several reports and correspondence, each covering only a part of the total project area. The research and reporting has been done by different people at different times using different research methods. Michael Marshall's reports (see "Works Consulted"), in addition to some preliminary work in part of the Church Rock parcel, deal with the Crownpoint and Unit 1 parcels. Earnest Baccanti's report (see "Works Consulted") deals with the Crownpoint and Unit 1 parcel and with the Church Rock parcel. The Museum of New Mexico's report (see "Works Consulted") deals with Church Rock and Crownpoint Section 12 parcels as well as the haul route between Church Rock and Crownpoint. No uniform set of information has been collected on each of the parcels that together make up the project area. The various reports fail

to use a uniform set of information sources and uniform methods for gathering information. Finally, the information on all parcels has not been compiled into one document. Dividing information among multiple documents makes review for compliance with applicable cultural resource management laws and policies more difficult, because, for example, reviewers must assess the significance of each cultural resource in the context of all this information in aggregate.

6. Some parts of the project area, such as parts of Crownpoint and Unit 1 parcels, have not been inspected by archaeologists on foot at all. Yet I know from my professional experience that Navajo Nation standards for compliance with applicable federal and Navajo Nation cultural resource laws on Navajo jurisdiction require that a professionally qualified archaeologist conduct a complete inspection of the project area on foot. According to current Navajo Nation Historic Preservation Department "Interim Fieldwork and Report Standards and Guidelines" (see "Works Consulted"), the archaeologist(s) must walk across the project area with transects spaced no more than 15 meters apart (p. 1). The HRI parcels that archaeologists have inspected have been covered at varying degrees of intensity. Different archaeologists have recorded their findings at different levels of detail.

7. HRI's documentation of Navajo and other tribal "traditional cultural properties" is particularly fragmented, unstandardized, and incomplete, and does not comply with professional standards. HRI's cultural resource researchers identify several other tribes besides Navajo as having potential traditional interests in the project area. The tribes identified include Zuni, Acoma, Laguna, and Hopi. A careful effort to identify potentially interested tribes might have identified others as well, such as Jemez. Yet these researchers report virtually no information about these other tribes, even though, in my experience, libraries in Window Rock, Gallup, Albuquerque, and Santa Fe have ample collections of the relevant literature, and even though all of the tribal governments identified are experienced at providing cultural resources information when consulted by agencies and project proponents.

8. To document Navajo traditional cultural properties, the Navajo Nation Policy to Protect Traditional Cultural Properties requires professionally qualified researchers to consult the relevant literature, Navajo chapter officials, Navajo residents living in and near the project area (including but not limited to those with permits to use the project area), and Navajo ceremonial practitioners referred by chapter officials or local residents. National Register Bulletin 38 also instructs researchers to consult both the

literature and community members with sound knowledge of tradition. HRI's cultural resource researchers have consulted these sources incompletely and unsystematically, as described in the following paragraph.

9. HRI's various researchers have not consulted the same body of the literature on Navajo ceremonialism and traditional land use for each parcel of the project area. For example, the Museum of New Mexico researchers consulted far fewer scholarly works about the parcels they address (Church Rock and Crownpoint Section 12) than Marshall did about the parcels he addresses (Crownpoint and Unit 1).

10. Consulting relevant literature is necessary to identify previously recorded cultural resources and the qualities that contribute to the significance of these resources or others of the same type. Information from the literature is also necessary as a context for assessing the significance of other cultural resources identified through field work. HRI's Museum of New Mexico researchers consulted some contract archaeology reports but used few scholarly sources on Navajo history and culture. Both types of sources are important. For example, the Museum of New Mexico researchers ignored the great majority of articles on Navajo, Zuni, Hopi, Acoma, and Laguna in the Handbook of North American Indians, Southwest (volumes 9 and 10 published by the Smithsonian Institution). Also, they do

not cite historical research compiled in reference to the land claims of these tribes before the Indian Claims Commission and published by Garland Press. Both of these sources are among the many basic reference works on Southwest Indian culture and history that professional cultural resource researchers use. The background information in the Museum of New Mexico report based on this spotty use of literature contains many factual errors. The report also lacks the kind of background information on Navajo ceremonial and traditional land use that is necessary for assessing the significance of specific cultural resources and recommending measures to mitigate the ways that the project might adversely affect them.

11. None of HRI's researchers document consultations with Crownpoint chapter officials about the Crownpoint and Unit 1 parcels. HRI's Museum of New Mexico researchers consulted chapter officials about the Church Rock and Crownpoint Section 12 parcels, but not about the main Crownpoint or Unit 1 parcels. HRI's consultant Earnest Becenti is himself a Church Rock chapter officer, but his report does not mention consulting Crownpoint chapter officials about the Crownpoint or Unit 1 parcels. Consultations with chapter officials and local residents evidently were not part of Marshall's scope of work.

12. None of HRI's cultural resource researchers have systematically consulted residents in or near the Crownpoint or Unit 1 parcels. The Museum of New Mexico researchers did not interview local residents living in or near the Church Rock or Crownpoint Section 12 parcels. Earnest Becenti interviewed people living near the Church Rock parcel only, and not those living in or near the Crownpoint or Unit 1 parcels.

13. HRI's researchers did not consult an adequate range of Navajo ceremonial practitioners. Only one ceremonial practitioner was consulted about Crownpoint and Unit 1 -- Church Rock chapter official Earnest Becenti, who consulted himself. The Museum of New Mexico researchers consulted ceremonial practitioners about the Church Rock and Crownpoint Section 12 tracts. But practitioners consulted seem to be those named by chapter officials only, since Museum of New Mexico researchers did not contact Navajos living in or near the Crownpoint Section 12 or Church Rock tracts and therefore could not have gotten names of practitioners from those residents. Earnest Becenti does not report contacting any practitioners whom the residents he interviewed might have recommended, and he does not specify whether the people whom these residents referred him to are practitioners. By ignoring referrals from residents living in and nearest the project area, the reports fail to

comply with Navajo Nation policy.

14. HRI's cultural resource researchers did not follow Navajo Nation interview and reporting standards set forth in the Policy to Protect Sacred Places. Although Earnest Becenti used and recorded interviewees' responses on the information checklist recommended by the Navajo Nation Historic Preservation Department for such interviews, he failed to include all the relevant information from this checklist in his report. For example, in his "Report on Sacred and Traditional Places for Hydro Resources, Inc. (attached to Heartfield's report; see "Works Consulted"), Becenti states (part VII.), "No significant sacred and traditional sites were found. ... They reported of family grave sites near their residents which are clearly marked and sweat lodges that were no longer used. These should not make a major impact on the proposed project." Yet the checklist that Becenti filled out for his interviews with Wilhelmina Yazzie and Dorothy Livingston show that each foresees adverse effects on her homesite by the project, even if it is as far away as a mile (according to Ms. Yazzie) or 2-3 miles (according to Ms. Livingston). The Museum of New Mexico researchers give no evidence of using this checklist, and also do not report certain types of information that Navajo Nation report standards require. The following paragraph gives examples of failures by both

the Museum of New Mexico researchers and Earnest Becenti to follow Navajo Nation requirements.

15. HRI's cultural resource researchers do not report asking interviewees whether they have concerns about possible adverse effects from the project on the specific hogans, sweathouses, corrals, and so forth identified in the archaeological inventories for various parcels of the project area. These researchers also fail to state whether any in-use structures are present in any of the parcels, let alone evaluate their significance as possible historic or traditional cultural properties. Yet the Navajo Nation Policy to Protect Traditional Cultural Properties and the suggested interview checklist make clear that these types of archaeological and in-use structures may also be "traditional cultural properties." A cultural resource is a "traditional cultural property" if it has traditional significance to living people who carry on those traditions. The Navajo Nation Policy and National Register Bulletin 38 make clear that traditional cultural properties include, among other things, archaeological sites, landscape features with no evident human modification, and constructions still in use. According to Bulletin 38,

A traditional cultural property, then, can be defined generally as one that is eligible for inclusion in the National Register because of its

association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community.

16. In assessing project effects on cultural resources, HRI's reports systematically ignore how the project may affect traditional cultural properties and other cultural resources **outside** the project area. According to National Register Bulletin 38 (p. 19), "a given activity outside the boundaries of a traditional cultural property may constitute an adverse effect" on "those qualities of a property's visual, auditory, and atmospheric setting that contribute to its significance." Among the ways that a project may affect cultural resources outside the area of direct physical disturbance are by producing intrusive or dangerous traffic, unacceptable noise, visual interference, and dust, for example (36 CFR 800.9b). A project may also impede access to other places outside the project area.

17. HRI's cultural resource researchers did not ask interviewees whether they think noise, visual interference, dust, traffic, and other intrusions from the proposed project might affect traditional cultural resources outside the project area. Yet interview responses recorded by Earnest Becenti (see paragraph 14 above) indicate that

interviewees (Navajos living near the Church Rock parcel) do expect adverse effects from mining within 1-3 miles of their homesites. Homesites and the loci of traditional activities in and around them are likely to be traditional cultural properties, because their users are likely to consider them significant in maintaining traditions. These same interviewees also told Becenti about sacred places within these distances of the Church Rock parcel. Mr. Becenti did not record what specific ways interviewees might foresee the project adversely affecting these places. Also, he did not record the locations of interviewees' homesites, customary use areas, and sacred places they identified as within possible range of adverse effects of the project.

18. HRI's researchers also ignored the project's possible adverse effects on ground water under and outside the project area. Ground water sources are potentially significant Navajo traditional cultural properties. For example, springs are likely to be Navajo ceremonial offering places, and naturally occurring waters are likely to be collected for use in ceremonies, including for making medicinal drinks and foods that participants swallow. Several times in the last few years, Gallup and Albuquerque newspapers have reported statements by Crownpoint residents that they believe this project can contaminate ground water. Thus there is ample indication of a locally perceived

possibility for the project to contaminate sacred springs outside the project areas. Normal professional procedure is to ask about such concerns in cultural resource interviews. Therefore, in my professional opinion, the cultural resource reports do not comply with professional standards for identifying traditional cultural properties.

19. As a researcher on Navajo sacred places, I am aware that the literature on Navajo ceremonialism mentions several such places near the project parcels. Only one of these places (Kin Yaa'a) is mentioned in HRI's cultural resource reports. Some of these places are named zones that may extend into various project parcels and may contain a variety of ceremonially used resources. Interviews are necessary to determine whether these places are still significant to Navajo traditionalists, and whether the project would adversely affect the qualities that make these areas significant to Navajo traditionalists, including impeding their access to and uses of these areas.

20. HRI's cultural resource researchers did not ask specifically about these places. They probably were not aware of most of these places since their reports do not cite the works that mention these places. In my professional opinion, because important questions remain about the actual significance of these places to people today and the project's possible adverse effects on them, it

is not possible to take accurate account of how the project, or issuing a license for it, will adversely affect significant cultural resources.

21. HRI's cultural resource reports also are inconsistent on how transporting slurry between Church Rock and Crownpoint might affect significant cultural resources along the route. Museum of New Mexico researchers report that interviewees were concerned about adverse effects from accidents. Their report denies that these concerns are attached to particular "traditional cultural properties" as defined by the Museum of New Mexico researchers. As noted above, however, these researchers ignore the fact that the commonly accepted definition of traditional cultural properties includes structures and activity areas currently used for traditional purposes (see National Register Bulletin, p. 1). Their excessively narrow definition of traditional cultural properties leaves open the question whether Navajos living along the transport route foresee adverse effects on such structures and activity areas. HRI consultant Earnest Becenti evidently did not ask interviewees about possible effects of slurry transport. Thus HRI's reports do not deal adequately with how slurry transport might adversely affect traditional cultural properties.

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22. HRI's cultural resource reports tend to define individual clusters of remains of human activity as archaeological sites and fail to recognize that archaeological sites may also be traditional cultural properties. HRI's reports propose to prevent adverse effects on significant cultural resources inside the project area by avoiding direct physical disturbance. There are two problems with this avoidance strategy. First, HRI's 1993 proposed wellfield site layouts for Crownpoint and Unit 1 parcels (see "Works Consulted") show wells coinciding with locations of archaeological sites. Second, archaeological sites are shown on these maps as dots rather than shapes that reflect a careful mapping of their true surfacial extent. Even if the surface wells avoid surface manifestations of sites as defined by HRI, they may disturb subsurface archaeological materials. The wells in these maps are so densely distributed that such disturbance is extremely likely.

23. HRI's cultural resource reports also do not adequately cover cultural landscapes as a type of cultural resource. Applicable cultural resource guidelines recognize cultural landscapes as significant types of resources. An example of a cultural landscape is the Helkau Historic District, which, according to National Register Bulletin 38 (p. 18), takes in "a substantial portion of California's

North Coast Range." For the practical purpose of unambiguously defining the area for listing on the National Register, this historic district's boundaries were, according to Bulletin 38 (p. 18), "defined more narrowly" to include "all the locations at which traditional practitioners carry out medicine making and similar activities, the travel routes between such locations, and the immediate viewshed surrounding this complex of locations and routes."

24. The Helkau Historic District example shows that, in a cultural landscape, spots on the land surface identified as "archaeological sites" and "traditional cultural properties" are related to each other and to the surrounding land surface and subsurface. At any one time, land users have conducted interlinked activities at different spots in their land-use area. They have chosen these spots partly with reference to the character of the land and its resources, partly with reference to their other activities. Through time, their successors continue or modify these activity patterns and land uses, re-using or abandoning spots in favor of others, including spots nearby. Archaeological and ethnohistorical research tries, among other things, to reconstruct these past activities and the life systems that they have constituted. This kind of research requires that the landscape maintain a certain

degree of integrity.

25. The methods of data gathering and reporting used by HRI's cultural resource researchers are inadequate to determine the full extent to which the spots defined as cultural resources form integrated landscapes. Yet the project area may affect landscapes with qualities that make them significant to Navajo traditionalists, those of other tribes, or both. In addition, these landscapes as integrated wholes may contain as-yet untapped information about the past that can help answer research questions significant to cultural resource researchers, thereby making these landscapes eligible to the National Register of Historic Places under eligibility criterion d.

26. Avoiding archaeological sites and confining land disturbance to the interstices among them can nevertheless destroy the integrity of significant cultural landscapes. Such disturbance may thereby compromise the qualities that make them significant to traditionalists. Disturbance is also likely to reduce the research potential of these landscapes, another quality that makes them significant. But avoiding these spots -- while disturbing the area between spots -- is the only measure proposed in any of HRI's cultural resource reports to mitigate adverse effects on significant cultural resources. Therefore, this proposed mitigating measure is unlikely to preserve information

content and qualities that may contribute to their significance as traditional cultural properties, and thereby compromise their eligibility to the National Register of Historic Places.

27. The information content of sites analyzed together as whole landscapes is also important for another research objective, reconstructing continuities and discontinuities between precolumbian and more recent times. HRI's cultural resource reports, even though spotty and inconsistent, show that people have conducted a range of daily and ceremonial activities in and around the project area more or less continuously from the early centuries A.D. to the present. Therefore, even HRI's research indicates significant cultural landscapes that extend into the project area.

28. In my opinion, based on consulting work I have done with other professional cultural resource researchers, breaks between precolumbian and more recent land use in the southwestern United States in general may be more apparent than real. The break may be more the result of the scholarly division of labor between archaeologists, who gather information from ground surface observations, and ethnologists-historians, who gather information through in-depth interviews and documents. To correct this possible illusion, many cultural resource researchers are now using more tightly integrated interdisciplinary research programs

focussed on cultural landscapes.

29. Of HRI's cultural resource researchers, only Marshall discusses cultural landscapes, the Muddy Water and Kin Yaa'a archaeological complexes. In my opinion, Marshall under-represents the spatial and temporal extent and complexity of these landscapes. Based on my own work as a consultant with Navajo Nation Historic Preservation Department Chaco Protection Sites and Traditional Culture sections, my opinion is that Muddy Water and Kin Yaa'a should be researched as a single landscape. These two complexes together seem to consist of a more-or-less continuous distribution of archaeological features. It is further my opinion that postcolumbian features attributed to Navajos in this area should be included in the complex. Navajo ceremonial tradition links Navajos to both precolumbian and postcolumbian features in the complex.

30. In contrast to Marshall, and based on my work with the Navajo Nation Historic Preservation Department, my opinion is that ground disturbance in the interstices of the archaeological sites that make up this landscape is likely to have an adverse effect on the landscape. The ground disturbance will be widespread enough to alter large parts of the land surface and subsurface. Disturbance also may include changing the distribution and character of groundwater sources. Groundwater sources would have

significantly influenced the locations of cultural activities and their archaeological manifestations. HRI's project may change large parts of the land surface and subsurface beyond the ability of researchers to reconstruct their influence on placement of past human activities as evidenced by archaeological sites and other cultural manifestations.

31. In sum, HRI's cultural resource reports do not adequately assess the significance of cultural resources in the project area or in areas outside that the project may affect. The reports also do not adequately assess the possible adverse effects on significant cultural resources that the project or licensing it may have. The most basic reason for these inadequacies is the incomplete, fragmentary, and inconsistent collection of information needed to comply with the Navajo Nation's Interim Fieldwork and Report Standards and Guidelines (see "Works Consulted"). These standards and guidelines require all reports not only to inventory culture resources, but also to identify the qualities that make these resources significant, assess how the project and its licensing may affect those qualities, and propose measures to mitigate adverse effects.

I declare on this 8th day of January, 1998, at Gallup, New Mexico, under penalty of perjury, that the foregoing is true and correct.

Klara B. Kelley

Klara B. Kelley

Sworn and subscribed before me, the undersigned, a Notary Public in and for the State of New Mexico, on this 8th day of January, 1998, at GALLUP, New Mexico. My commission expires on 1-19-1999.

[Signature]
Notary



OFFICIAL SEAL
MICHAEL E. LUNN
NOTARY PUBLIC-STATE OF NEW MEXICO

My commission expires: 1-19-99

VITA: Klara B. Kelley

P.O. Box 2635, Gallup, NM 87305
505-371-5306

Degrees

B.A., George Washington University, Washington, D.C., 1970
M.A., Anthropology, University of New Mexico, Albuquerque, 1974
Ph.D., Anthropology, University of New Mexico, 1977

Fellowships

National Science Foundation Graduate Fellowship, 1971-1974
National Science Foundation Dissertation Improvement Grant 1975
American Association of University Women Dissertation Fellowship,
1975-76

Professional work excluding consulting

1971-72 Linguistic Analyst, Navajo Reading Study, University
of New Mexico

1974-75 Statistical abstractor, Bureau of Business and
Economic Research, University of New Mexico

1976-77 Instructor, Native American Studies Center,
University of New Mexico. Course taught: Reservation Economic
Development.

1977-78 Instructor, Navajo Community College, Tsaile, AZ.
Courses taught: Introductory Anthropology--cultural; Introductory
Anthropology--human prehistory; Introductory Economics--
microtheory; Introductory Economics--macrotheory; and a course to
prepare students for Arizona GED exam in social studies.

1980-83 Ethnohistorian (1980-81), technical editor (1982),
and Assistant coordinator (1982-83), Navajo Nation Cultural
Resource Management Program, Window Rock, AZ. Ethnohistorical
research (see field work below), then editing archaeological
reports, then (as assistant coordinator) conducting archaeological
inventory surveys, maintaining site and report files, writing
proposals, representing program at professional meetings, general
administrative duties.

1984 Anthropologist, Bureau of Land Management, Socorro, NM,
Resource Area. See field work below.

1985-88. Archaeologist and technical editor, Navajo Nation
Archaeology Department, Window Rock, AZ. Conducting archaeological
inventory surveys, editing all archaeological reports that
professional staff of department produced, conducting
ethnohistorical research for archaeological projects and
environmental documents, on-job instruction of Navajo staff
archaeologists, helping to develop uniform policies for
identifying and protecting Navajo graves and sacred places,
conducting background research for Navajo Nation land acquisitions,
miscellaneous administrative duties.

1988-93. Ethnohistorian, Navajo Nation Historic Preservation Department, Window Rock, AZ. Conducting ethnohistorical research for cultural resource management planning (major effort was designing -- and conducting most of the field work for -- a survey of Navajo communities to learn about local historic preservation concerns); representing department on committees, work groups, and task forces involving other Navajo Nation, state, and federal agencies about preservation matters; representing Navajo Nation as an expert witness in federal court and in state administrative proceedings; advising department and division heads on cultural resource preservation policies and developing sacred places protection policy; preparing grant applications; reviewing cultural resource preservation documents within framework of Navajo Nation, federal, and state laws.

Consulting (short-term consultations and projects in progress excluded)

1975 Kirschner Associates, Albuquerque. Writing a proposal to do a socioeconomic technical document for an environmental impact statement.

1976 Native American Studies Center, University of New Mexico. Writing grant proposals for a Native American history curriculum development project.

1977 Isleta Pueblo Headstart Program. Miscellaneous research.

1977 Larry Adcock and Associates, Albuquerque. Data analysis for socioeconomic background reports for environmental impact statements.

1977 Harbridge House, Boston. See field work below.

1978 Larry Adcock and Associates. Data analysis for socioeconomic background reports for environmental impact statements.

1978-80 Office of Contract Archeology, University of New Mexico. See field work below.

1980 Navajo Nation Division of Economic Development. Writing portions of an implementation plan for a Navajo Nation Minerals policy.

1982 School of American Research, Santa Fe. See field work.

1983 Soil Systems, Inc., Phoenix. Writing ethnohistories for Fort Wingate and White Sands Missile Range.

1984-85 Pittsburg and Midway Coal Mining Company, Gallup, NM. See field work below.

1993 Office of Contract Archeology, University of New Mexico. Providing background material for Transwestern Pipeline expansion technical report.

1993-94 Navajo-Hopi Land Commission, Window Rock, AZ. Compiling previously recorded information on Navajo sacred places in the 1882 Executive Order Reservation.

1993-94 Navajo Nation Historic Preservation Department, Glen Canyon Environmental Studies Section. Compiling previously recorded information on Navajo sacred places in and around Marble Canyon, the Grand Canyon, and related landscapes.

1993-94 Navajo Nation Justice Department. Interviewing and compiling socioeconomic data about communities in Former Bennett and Statutory Freeze Area.

1993-94, 1995-96 Dames & Moore, Phoenix. Providing information about potential impacts of Navajo Transmission Project on Navajo sacred places, to be used in the Environmental Impact Statement for this project. See also field work below.

1995 Navajo Nation Historic Preservation Department. Collaborative work with NNHPD staff archaeologist on precolumbian archaeology.

1995-1996. Navajo Nation Historic Preservation Department. Compiling and analyzing historical documentation on Navajo and non-Indian use of Nahat'a Dził (Chambers-Sanders Trust Lands), Navajo Nation, to be part of a cultural resource inventory and management plan.

1995-1996. Nahat'a Dził Woodland and Wildlife Management Plan, by Ecosystem Management Inc. for Office of Navajo and Hopi Indian Relocation. See field work below.

1995-1997. Ecosystems Management Inc., Gallup. Research for Glen Canyon National Recreation Area. See field work below.

1993-present. Archaeological surveys and/or interviewing for miscellaneous small projects compliance with federal and state cultural resource protection laws. Clients include:

- Southwest Archaeological Consultants, Inc., Santa Fe
- Navajo Tribal Utility Authority
- Marron and Associates, Albuquerque
- Ecosystems Management Inc., Gallup

- Navajo Nation
- Zuni Cultural Resource Enterprise

Field work (small projects excluded)

1968-69 Two summer session of University of New Mexico archaeological field school excavating at Sapawe, a large protohistoric-period pueblo near El Rito, NM.

1973 Independent field work observing trading posts in the hinterland of Gallup, NM.

1974-75 Dissertation field work. Interviews with more than 400 commercial and manufacturing firms in northwestern New Mexico, northeastern Arizona, southwestern Colorado, and southeastern Utah. The research concerned the present commercial structure of the Navajo-Hopi-Zuni region and its historical development, with a focus on trading posts.

1977 Public opinion survey in northwestern New Mexico for U.S. Bureau of Land Management coal leasing regional environmental impact statement for San Juan Basin of New Mexico (contract with Harbridge House).

1978-79 Ethnohistorical and ethnoarchaeological research for Pittsburg and Midway Coal Mining Company (contract with Office of Contract Archeology, University of New Mexico). Intensive data recovery on McKinley Mine South Lease for compliance with National Historic Preservation Act. My work concerned historical and current Navajo land-use patterns in and around the leasehold and interviews with more than 80 people.

1980 Ethnohistorical and ethnoarchaeological research for Alamito Coal Company (employed by Navajo Nation Cultural Resource Management Program). Intensive data recovery for compliance with National Historic Preservation Act. My work concerned the activities of oil drillers, Navajos, and Hispanic shepherds working for a large-scale absentee owner and interviews with 50-60 people.

1981-83 Document research and interviewing Navajo people for ethnohistorical portions of several contract archaeology projects of the Navajo Nation Cultural Resource Management Program and School of American Research; conducting archaeological surveys.

1984 Document research and interviewing residents of the Quemado, NM, vicinity and representatives of Navajo, Zuni, Acoma, and Laguna tribes about their use of the San Augustine Coal Area (about 25-30 people), conducted for Bureau of Land Management coal-leasing planning documents.

1984-85 Ethnohistorical and ethnoarchaeological research for Pittsburg and Midway Coal Mining Company McKinley Mine North Lease. Field research similar to the 1978-79 South Lease research above, but with interviews with about 20 people and an emphasis on site-formation processes rather than on land use.

1985-88 Archaeological inventory surveys and accompanying ethnohistorical research for Navajo Nation Archaeology Department (estimated 50+ reports).

1986-87 Preparation of a socioeconomic technical document for a Supplementary Environmental Impact Statement on the proposed Dine Power Project (formerly New Mexico Generating Station) at Bisti, NM. The field work involved interviewing about 20 people representing families that use land proposed for the Dine Power Plant and related coal mines. (Navajo Nation Archaeology Department contract with Public Service Company of New Mexico.)

1987-88. Interviews with chapter officials and 40-50 other people in 8 chapters of the Navajo Nation to learn about historic preservation concerns of the Navajo people themselves, then documenting the places identified. Navajo Nation Historic Preservation and Archaeology Department grants from New Mexico and Arizona State Historic Preservation Offices.

1988-89 Inspection and recording of approximately 80 archaeological sites in the Tuba City and Navajo Mountain areas reportedly occupied by Navajos, Hopis, Paiutes, and people of mixed Navajo-Paiute ancestry. Work was in preparation for expert witness testimony on behalf of the Navajo Nation in litigation in federal court concerning the 1934 Reservation.

1990. Interviews with approximately 25 Navajo residents of Hopi Partitioned Lands in 1882 Reservation to identify sacred places for Navajo-Hopi Land Office (a Navajo Nation program).

1990, 1992 Interviews with 16 Navajo residents of Canyon de Chelly National Monument to identify landscapes culturally important to Navajos; field documentation of places identified. Two-phase project with funding from National Park Service to Navajo Nation Historic Preservation Department.

1993-1995. Recording comments at two rounds of public scoping meetings in more than a dozen communities all around Navajoland about possible impacts of the proposed Navajo Transmission Project (my focus was on the cultural concerns that local people expressed); interviews with four ceremonial practitioners about certain alternative route segments in 1993; interviews with Navajo chapter officials about mitigating measures in 1995.

1993-94. Interviews of about half of a sample of 50 families in the former Bennett and Statutory Freeze Area to determine various socioeconomic conditions during the Bennett and Statutory Freezes (collaboration with Dr. Scott Russell).

1995-1996. Nahat'a Dziil Woodland and Wildlife Management Plan, by Ecosystem Management Inc. for Office of Navajo and Hopi Indian Relocation. Recording comments of Navajo residents of Nahat'a Dziil in public meetings and private interviews for interdisciplinary community-based planning team.

1995-1997. Glen Canyon National Recreation Area Ethnobotanical Study by Ecosystem Management Inc. for National Park Service. Principal Investigator for interdisciplinary research team to interview about 20 Navajo and San Juan Southern Paiute ceremonial practitioners about traditional uses of plants and botanical protection policies in Glen Canyon National Recreation Area.

1993-present. Archaeological surveys and/or interviewing for miscellaneous small projects compliance with federal and state cultural resource protection laws. See Consulting above.

Writings: Books and Articles

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Writings: Conference Papers and Presentations

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1981 Archaeological Treatment of 20th Century Navajo Sites. Paper presented at the 46th Annual Meeting of the Society for American Archaeology.

1983 Historic Preservation and Navajo Family and Community History. Paper presented at the New Mexico Family and Community History Conference, Albuquerque, NM.

1983 The Ethnoarchaeology of Navajo Trading Posts. Paper presented at the American Society for Ethnohistory annual meeting, Albuquerque, NM.

1985 Are We Really Ready for a Regional Research Design in Navajo CRM Archaeology? Paper presented at the First Navajo Studies Conference, Albuquerque, NM.

1987 New Questions about Early Navajo Archaeology. Paper presented at the Second Navajo Studies Conference, Flagstaff, AZ.

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1982 The Black Creek Valley: Ethnohistoric and Ethnoarchaeological Investigations of Navajo Political Economy and Land Use. In Prehistoric and Historic Occupation of the Black Creek Valley, Northeastern Arizona and Northwestern New Mexico, by Russell T. Fehr, Klara B. Kelley, Linda Popelish, and Laurie E. Warner. Navajo Nation Papers in Anthropology 7. Navajo Nation Cultural Resource Management Program, Window Rock.

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1982 Navajo Ethnohistory of the Carrizo Flats and Vicinity. In The Carrizo Flats Survey: Anasazi and Navajo Occupation in the Red Rock Valley Area of Arizona, Navajo Nation, by Laurie E. Warner and Mark D. Elson. Navajo Nation Papers in Anthropology 17. Navajo Nation Cultural Resource Management Program, Window Rock.

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