Appendix A

Comments Received on the Environmental Review

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Part I – Comments Received During Scoping

On May 10, 2002, the U.S. Nuclear Regulatory Commission (NRC) published a Notice of Intent in the *Federal Register* (67 FR 31847) to notify the public of the staff's intent to prepare a plant-specific supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2, to support the renewal application for the Fort Calhoun Station, Unit 1 operating license. This plant-specific supplement to the GEIS has been prepared in accordance with the National Environmental Policy Act (NEPA) and 10 CFR Part 51. The NRC initiated the scoping process, as described in 10 CFR Part 51, with the issuance of the *Federal Register* Notice. The NRC invited the applicant; Federal, State, and local government agencies; local organizations; and individuals to participate in the scoping process by providing oral comments at scheduled public meetings and/or submitting written suggestions and comments no later than July 10, 2002.

The scoping process included two public scoping meetings, which were held at the Days Hotel Carlisle in Omaha, Nebraska, on June 18, 2002. Approximately 80 people attended the meetings. Each session began with NRC staff members providing brief overviews of the license renewal process and the NEPA process. After the NRC's prepared statements, the meetings were opened for public comments. Twenty-one attendees provided either oral statements that were recorded and transcribed by a certified court reporter or written statements. The meeting transcripts are an attachment to the *Fort Calhoun Station Unit 1 Public Meeting Summary Report*, dated July 12, 2002. The Public Electronic Reading Room (ADAMS) accession number for the summary report is ML021960359. (This accession number is provided to facilitate access to the document through the Agencywide Documents Access and Management System [ADAMS] at <http://www.nrc.gov/reading-rm.html>.) In addition, four letters and two e-mail messages were received by the NRC in response to the Notice of Intent.

At the conclusion of the scoping period, the NRC staff and its contractor reviewed the transcripts and all written material received to identify specific comments and issues. Each set of comments from an individual was given a unique identifier (Commenter ID) so that the comments could be traced back to the original transcript, letter, or e-mail containing the comment. Specific comments were numbered sequentially within each comment set. Several commenters submitted more than one set of comments (e.g., they made statements in both the afternoon and evening scoping meetings). In these cases, there is a unique Commenter ID for each set of comments.

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Table A-1 identifies the individuals who provided comments applicable to the environmental review and gives the Commenter ID associated with each set of comments. Individuals who spoke at the scoping meetings are listed in the order in which they spoke at the public meeting, and individuals who provided comments by letter or e-mail are listed at the end of the table. To maintain consistency with the scoping summary report (*Fort Calhoun Station Unit 1 Environmental Scoping Summary Report*, dated November 22, 2002), the unique identifier used in that report for each set of comments is retained in this appendix.

Table A-1. Individuals Providing Comments During the Scoping Comment Period

Commenter ID	Commenter	Affiliation (If Stated)	Comment Source
FCS-A	Mick Mines	Mayor, Blair, NE	Afternoon Scoping Mtg.
FCS-B	Larry Halford	Mayor, Fort Calhoun, NE	Afternoon Scoping Mtg.
FCS-C	Gary Gates	Omaha Public Power District (OPPD)	Afternoon Scoping Mtg.
FCS-D	Joe Gaspar	OPPD	Afternoon Scoping Mtg.
FCS-E	Lou Burgher	Greater Omaha Chamber of Commerce	Letter (see FCS-Z)
FCS-F	Cheryl Straub	Greater Omaha Chamber of Commerce	Afternoon Scoping Mtg.
FCS-G	Sam Augustine	University of Nebraska	Afternoon Scoping Mtg.
FCS-H	John Pollack	Private Citizen, Meteorologist	Afternoon Scoping Mtg.
FCS-I	Terry Moore	Omaha Federation of Labor	Afternoon Scoping Mtg.
FCS-J	Jonathan Schwartz	Nebraska Emergency Management Agency	Afternoon Scoping Mtg.
FCS-K	Al Berndt	Nebraska Emergency Management Agency	Letter (see FCS-Y)
FCS-L	Bill Pook	Region 56, Nebraska Emergency Management Agency	Afternoon Scoping Mtg.
FCS-M	Terry Hummel	Pottawattamie, Iowa Emergency Management Agency	Afternoon Scoping Mtg.
FCS-N	Alan Schlesinger	Private Citizen, Retired Biology Professor	Afternoon Scoping Mtg.
FCS-O	Toby Churchill	Sarpy County Economic Development Corporation	Evening Scoping Mtg.
FCS-P	Gary Gates	OPPD	Evening Scoping Mtg.
FCS-Q	Joe Gaspar	OPPD	Evening Scoping Mtg.

Table A-1 (contd)

Commenter ID	Commenter	Affiliation (If Stated)	Comment Source
FCS-R	Carl Rennerfeldt	City of Blair, NE, Fire Dept.	Evening Scoping Mtg.
FCS-S	Frances Mendenhall	Private Citizen, Dentist	Evening Scoping Mtg.
FCS-T	Jeffrey Pokorny	Private Citizen, Businessman	Evening Scoping Mtg.
FCS-U	Tom Foster	Private Citizen, Businessman	Evening Scoping Mtg.
FCS-V	Donna Lotwaitis	Private Citizen, Consultant	Evening Scoping Mtg.
FCS-W	Joe Pettit	Private Citizen, Green Party	Evening Scoping Mtg.
FCS-X	Bret Voorhees	Iowa Emergency Management Division	E-mail, June 18, 2002 (ML021860452)
FCS-Y	Al Berndt	Nebraska Emergency Management Agency	Letter, June 4, 2002 (ML021890064)
FCS-Z	Louis Burgher	Greater Omaha Chamber of Commerce	Letter, June 18, 2002 (ML021860437)
FCS-AA	Sam Augustine	University of Nebraska Medical Center	Letter, June 18, 2002 (ML021860433)
FCS-AB	John Pollack	Private Citizen, Meteorologist	E-mail, July 10, 2002 (ML021990682)
FCS-AC	Michael McLarney	United Way of the Midlands	Letter, July 9, 2002 (ML021970485)

Specific comments were categorized and consolidated by topic. Comments with similar specific objectives were combined to capture the common essential issues raised by the commenters. The comments fall into one of several general groups. These groups include

- Specific comments that address environmental issues within the purview of the NRC environmental regulations related to license renewal. These comments address Category 1 or Category 2 issues, or issues that were not addressed in the GEIS. They also address alternatives and related Federal actions.

- General comments (1) in support of or opposed to nuclear power or license renewal or (2) on the license renewal process, the NRC's regulations, and the regulatory process. These comments may or may not be specifically related to the Fort Calhoun Station, Unit 1 license renewal application.

- Questions that do not provide new information.

- Specific comments that address issues that do not fall within or are specifically excluded from the purview of NRC environmental regulations. These comments typically address issues such as the need for power, emergency preparedness, current operational safety issues, and safety issues related to operation during the renewal period.

Each comment applicable to this environmental review is summarized in this appendix. This information, which was extracted from the *Fort Calhoun Station Unit 1 Environmental Scoping Summary Report*, is provided for the convenience of those interested in the scoping comments applicable to this environmental review. The comments that are general or outside the scope of the environmental review for Fort Calhoun Station, Unit 1 are not included here. More detail regarding the disposition of general or nonapplicable comments can be found in the Environmental Scoping Summary Report.

The following pages summarize the comments and suggestions received as part of the scoping process that are applicable to this environmental review, and discuss the disposition of these comments and suggestions. The parenthetical alphanumeric identifier after each comment refers to the comment set (Commenter ID) and the comment number.

Comments in this section are grouped in the following categories:

(1) Comments Concerning Category 1 Water-Quality Issues
(2) Comments Concerning Category 1 Land-Use Issues
(3) Comments Concerning Category 1 Air-Quality issues
(4) Comments Concerning Human-Health Issues
(5) Comments Concerning Category 1 Socioeconomic Issues
(6) Comments Concerning Category 2 Socioeconomic Issues
(7) Comments Concerning Category 2 Threatened-or-Endangered-Species, Aquatic-Ecology, or Terrestrial-Resources Issues
(8) Comments Concerning Alternatives
(9) Comments Concerning Postulated-Accident Issues

Comments

1. Comments Concerning Category 1 Water-Quality Issues

As stated in 10 CFR Part 51, Table B-1, Category 1 water-quality issues include such issues as the following:

- Altered current patterns at intake and discharge structures
- Scouring caused by discharged cooling water
- Altered thermal stratification of lakes

Comment: In the area of water, OPPD looked at the water quality, water flow associated with the intake and discharge and the aquatic ecology. Our review of historical data, current conditions and operations indicated that the continued operation beyond 2013 will not adversely impact the Missouri River flow, water quality, or aquatic ecology. (FCS-D-2)

Comment: In the area of water, OPPD looked at the water quality, the water flow associated with the intake and discharge, and the aquatic ecology. Our review of historical data, current conditions, and operations indicated that the continued operation beyond 2013 will not adversely impact the Missouri River flow, water quality, or aquatic ecology. (FCS-Q-2)

Response: *The comments are noted. Altered current patterns at intake and discharge structures were evaluated in the GEIS and were determined to be a Category 1 issue. The comments provide no new information on water quality and, therefore, will not be evaluated further. Water quality is discussed in Chapters 2 and 4 of the SEIS.*

2. Comments Concerning Category 1 Land-Use Issues

As stated in 10 CFR Part 51, Table B-1, Category 1 land-use issues include the following:

- Onsite land use
- Power line right of way

Comment: Relative to land use, land use at the OPPD site prior to construction was agricultural, and the balance of the property not supporting generation has been maintained in agricultural uses through lease arrangements with local farmers. (FCS-D-5)

Comment: Relative to land use, the land used at OPPD at the Fort Calhoun site prior to construction was agricultural, and the balance of the property not supporting generation has been maintained in agricultural uses through leases with local farmers. (FCS-Q-5)

Response: *The comments are noted. Onsite land use during the renewal period was evaluated in the GEIS and was determined to be a Category 1 issue. The comments provide no new information on onsite land use and, therefore, will not be evaluated further. Land use is discussed in Chapter 2 of the SEIS.*

3. Comments Concerning Category 1 Air-Quality Issues

As stated in 10 CFR Part 51, Table B-1, Category 1 air-quality issues include the following:

- Air quality effects of transmission lines

Comment: In the area of air quality, nuclear power represents about 30 percent of the generation utilized by OPPD customers. This makes a significant contribution to maintaining the air quality of the area, and there are no planned changes in the operations that will alter the air quality in any way. (FCS-D-4)

Comment: Relative to air quality, nuclear power represents about 30 percent of the generation utilized by our customers. This makes a significant contribution in maintaining the air quality of the area, and there are no planned changes in the operation that will alter the air quality in any way. (FCS-Q-4)

Response: *The comments are noted. Air-quality impacts from plant operations were evaluated in the GEIS and found to be minimal. These emissions are regulated through permits issued by the U.S. Environmental Protection Agency and the States. The comments provide no new information and, therefore, will not be evaluated further. Air quality is discussed in Chapter 2 of the SEIS.*

4. Comments Concerning Human-Health Issues

As stated in 10 CFR Part 51, Table B-1, Category 1 human-health issues include the following:

- Radiation exposures to the public during refurbishment
- Occupational radiation exposures during refurbishment
- Microbiological organisms (occupational health)
- Noise
- Radiation exposures to public (license renewal term)
- Occupational radiation exposures (license renewal term)

Comment: Finally, in the area of people, OPPD is committed to protecting the health and safety of its employees and the people who live within the communities around the plant. (FCS-D-7)

Comment: Finally, in the area of people, OPPD is committed to protecting the health and safety of its employees and the people who live in the communities around the plant. (FCS-Q-7)

Comment: But I want to get to another point that concerns me as a health professional, and that is the — what's happening to the radioactive isotopes that were proliferated all over the Northern Hemisphere after Chernobyl that everyone measured with great caution and concern and asked themselves, "What will happen here? What will the increases be in rates of cancer and birth defects and even deaths?"

I'm talking about strontium-90 and cesium-137. I did a little asking around, phone calling, and personal research, and I found that the U.S. Government measured human tissue samples up until 1982 of strontium-90, and then they quit doing it.

I found out that the Nebraska Department of Environmental Quality, which until 1998 was — it's not the DEQ, it's the Nebraska Department of Health, until 1998, was conscientiously sampling a lot of different things and measuring for the radioactive — various radioactive isotopes, including those two. But they never measured human tissue, and, in fact, they quit measuring anything at all in 1998. (FCS-S-6)

Comment: I submit to the NRC and OPPD that it would — it has become more important, not less important, to sample human tissue and to find out, you know, where the strontium-90 is and where the cesium-137 is.

This is — the story of the monitoring of strontium-90 is of particular interest to dentists because some of the best research that I know about was done on deciduous teeth that people turned in, and they could keep pretty good track of where the person had lived and, you know, what kind of exposure this person had had.

And what happened when they started doing this was they noticed that after the atmospheric nuclear testing stopped, they saw a drop in the amount of strontium-90 in the baby teeth that were turned in. But then, after a few years, when nuclear power plants began to be more common and the rate — you know, the amount of high-level waste, too, that was being produced, that rate of decline became less.

And I want to share with you one recent study that I think is germane here, and that I think should be considered in an environmental impact statement. And people, if they want to argue about the validity of the study, well, I'm waiting to hear. But here's what the study is and what it said.

Infant deaths and childhood cancers drop dramatically after nuclear plants close, and this was published April — last April 30th in the *Radiation and Public Health Journal*. And I'll just read you some data real quick here.

The reactor in LaCrosse, Wisconsin, closed in '87. The percent drop in juvenile cancer was 15.4. In Rancho Seco, California, it closed in '89. The percent drop was 16. In Fort St. Vrain, Colorado, the reactor closed in 1989. The percent drop was 15.4. In Trojan, Oregon, the reactor closed in 1992. The percent drop was 17.9. In Big Rock Point, Michigan, the reactor closed in 1997. The percent drop was 42.4. And when Maine Yankee, Maine, closed in 1997, the percent drop was 9.7.

There were also similar drops in temporary closed reactors in Pilgrim, Massachusetts, and Millstone, Connecticut. (FCS-S-8)

Comment: I'd like to close with some really hard core information out of another article called "Strontium-90 in Baby Teeth as a Factor in Early Childhood Cancer." And let me underscore that there is a demonstrated correlation in the presence of strontium-90 in baby teeth and childhood cancers of various kinds.

From 1982 to 1991, the number of operating U.S. reactors increased from 72 to 111, providing power in 32 of 50 states, in which 85 percent of the 1990 U.S. population resides. And electricity generation by these plants increased from 278,000 to 613,000 gigawatt hours — it looks like a little over doubling — before leveling off in the 1990s.

During this period, cancer incidence in 11 U.S. states and cities rose 40.4 percent for children age zero to four and 53.7 percent for those under one year. I'm not — I don't think they are suggesting causality, but it's a connection. So listen to the end of this. A time when average levels of cesium-137 and I-131 doubled. Okay?

Now, here's the point. We don't know where these isotopes are going. Without a system of monitoring the presence of key radioactive isotopes, such as strontium-90 in the human body, no definitive assessment of health effects of exposure to human-made radioactivity can be made.

Isn't that obvious? The average annual decline in adult strontium-90 uptake after 1970 was only about 5 percent. Okay. That would be after aboveground testing ended. Okay? As compared with 15.7 percent annual decline in strontium-90 uptake levels in adults from 64 — 64 to 70. Okay. So it declined a whole lot after the — after aboveground testing ended.

But then, when nuclear power plants came on the rise again, it stopped declining so much, reflecting perhaps the proliferation of large nuclear power reactors in the ‘70s and emissions from flawed underground tests.

Cancer incidence, age zero to four, in Connecticut, a small state with four operating nuclear reactors, which was as low as 14.42 per 100,000 in the late ‘60s, had reached 21.95 per 100,000 in the late ‘80s, a jump of over 52 percent.

This trend suggests that additional recent data on in vivo radioactivity in the U.S. are needed, particularly in the light of the puzzling decision of the DOE to terminate measures of strontium-90 in adults in 1982. In that year, dietary levels of strontium-90 uptake remained at the same level of — this is — the unit is picocuries per gram of calcium, and the number is 5.6.

Okay. It was 5.6 of this picocuries per gram of calcium in ‘81, comparable to the late ‘50s.

The last DOE report observed there has been some indication of slightly higher values for young adults during the last several years. These individuals were children during the period of greatest strontium-90 deposition.

One might presume from this statement that adult strontium-90 levels would rise in the ‘80s and ‘90s as baby boomers account for increasing proportions of the adult population and as an increasing number of nuclear power plants came on line.

So that’s my main concern is nobody is measuring this in human tissue. And that seems like a pretty serious environmental concern to me. (FCS-S-10)

Response: *The comments are noted. The NRC staff has provided a separate letter to the commenter (July 15, 2002; accession number ML021970486) on the general issues raised by the commenter at the Fort Calhoun Station, Unit 1 scoping meeting. In summary, the letter response outlines the results of the staff’s analysis of similar claims of adverse health effects (claims of elevated levels of childhood cancer) brought up in conjunction with public participation in the NEPA review process applicable to the request for license renewal for Turkey Point Units 3 and 4 (NUREG-1437 Supplement 5 [January 2002]). The staff concluded that it is unlikely that strontium-90 found in deciduous teeth would be derived from U.S. nuclear power plant operations because of the extremely small amount of strontium-90 released in effluents from operating U.S. plants. Furthermore, no causal relationship has been established between the levels of strontium-90 being reported in deciduous teeth and childhood cancer.*

The NRC’s regulatory limits for operating-plant effluent releases (and, therefore, the subsequent limits on dose to the public) are based on the radiation-protection recommendations of international and national organizations such as the International

Commission on Radiological Protection and the National Council on Radiation Protection and Measurements, which provide consensus standards developed from recent and ongoing research. The NRC ensures that effluents from operating plants under its oversight are within the established limits. The regulations related to radiological effluents and dose to the public can be found in 10 CFR Part 20 and 10 CFR Part 50, Appendix I. There is almost unanimous consensus among the scientific community on the adequacy of current radiation-protection standards.

As evaluated in the GEIS, radiation exposures to the public during the license renewal term has been determined to be a Category 1 issue. Based on the continued adequacy of the internationally accepted standards, the NRC's experience in reviewing effluent-monitoring data from operating plants in the United States, the staff's review and evaluation of the claims and diverse information brought up during recent NRC NEPA-process-related public comment periods, the results of ongoing research reflected in the scientific literature, and the absence of new information in these comments, the staff concludes that the topic of radiation dose to the public from operating plants is still properly characterized as a Category 1 license renewal issue. The comments provide no new information on human-health issues and, therefore, will not be evaluated further.

5. Comments Concerning Category 1 Socioeconomic Issues

As stated in 10 CFR Part 51, Table B-1, Category 1 socioeconomic issues include the following:

- Public services: public safety, social services, and tourism and recreation
- Public services, education (license renewal term)
- Aesthetics impacts (refurbishment)
- Aesthetics impacts (license renewal term)
- Aesthetics impacts of transmission lines (license renewal term)

Comment: I'll speak just a little bit about the socioeconomic impact on my city, in particular. From a practical standpoint, I'm not sure it makes sense to discard a proven and effective method of power generation, especially when it has served Washington County, eastern Nebraska, and OPPD for so many years. The Fort Calhoun Nuclear Station is an economic stimulus to Blair and the Washington County area.

Their footprint is a stabilizing factor in Washington County's economy. As an example, they employ 645 people; 135 of those live in Washington County; specifically, 110 live in the community of Blair. Their annual payroll is $43 million, and of that, $6.2 million is the payroll for those employees that live in Blair. And with just a very little bit of math, that shows that the annual income per employee living in Blair is $66,700. By any measure, that's a quality job. And those kinds of jobs attract and keep quality individuals, quality families in our community.

Now these people are our friends. They're our neighbors. Their kids go to school with my kids. They go to church. They volunteer their time to make Blair and Nebraska a better place to live.

In 2001, Fort Calhoun Station purchased almost $23 million of goods and services. Now I'm clearly not an economic developer, and I don't know the multiplier effect when you've purchased goods and you have sales and incoming property tax within the State of Nebraska. On the other hand, I do understand the positive impact that the Fort Calhoun Nuclear Station has on the quality of life and the quality of life of the 8000 people living in my city. Indeed, all Nebraskans benefit from the operation of the Fort Calhoun Nuclear Station.

OPPD is an outstanding community citizen. They're always there when we need them. They deliver prompt response to community requests. Their employees are involved in our local organizations and programs. And their service is nothing less than outstanding. As a Mayor, I'm confident in the ability of OPPD to deliver reliable power throughout my community. The rates are competitive, and because of that, they've been effective in recruiting new business, and I would point to Nebraska's single largest economic development investment, Cargill, which is just outside our city.

We'll hear from, I'm sure, people that are concerned about safety issues, and so am I. My family and I wake up every morning, and we can see the plant from our living-room window. Throughout the years though, I've come to know the people at OPPD, and I have confidence that they understand the risks associated with nuclear power generation and that they've been and continue to do everything in their power to ensure my safety. You see, at the same time, they're ensuring the safety of their families because they live in Blair too. (FCS-A-2)

Comment: That's not surprising when you consider our homes and our families are in the area. We contribute to the communities in volunteer work, and in our social leadership. It's also not surprising that we do that and the fact that we are owned by the people of our community who buy power from us. As you might know, Nebraska is unique among the 50 states in that all the electricity produced here is produced in a municipal or public manner. It is a public-power state.

Nebraskans take a great deal of pride in this uniqueness and in the fact that they own the organizations that provide the power. Our customers elect our Board of Directors; one of whom is with us today, Anne McGuire, who is chairman of our Nuclear Oversight Committee and Member of our Board.

In addition, the nuclear operations group at OPPD gets outstanding support from the rest of our company. Two other vice presidents are with me here today: Chuck Eldred, our Chief Financial Officer, and Tim Burke, who's responsible for retail and all the electric operations — the wires and transmission part of our company. (FCS-C-2)

Comment: We also know that to successfully operate our power plant, we must do it economically. Fort Calhoun Station is an economical source of electricity for our customers, and its cost-effectiveness continues to improve. We recently completed one of the most efficient refueling outages in the history of the plant, and it's a tribute to the workers at the plant and at OPPD and all the skilled labor that we have in the Omaha area that this outage was completed in a record fashion.

Looking ahead, we see continuing improvement in all areas of operation at Fort Calhoun. (FCS-C-4)

Comment: In addition to being a safely operating facility, Fort Calhoun operations have benefited the community in the form of jobs, payments in lieu of taxes, and community service. Continued operation would support the continuation of these benefits. (FCS-D-8)

Comment: OPPD has also been an excellent partner in our community's economic development efforts, with a proven record in planning for and meeting the area's energy needs.

OPPD has always been accessible and responsive to the public, and its proactive planning for future growth and demand has played a crucial role in the success that the Omaha area has enjoyed in accommodating a growing population and industrial base. We believe that Fort Calhoun will continue to provide essential electricity supplies for the growing metropolitan area and have full confidence in OPPD's operation of the facility. Thanks for your time and consideration. Louis W. Burgher, M.D., Ph.D., President. (FCS-E-3) (FCS-Z-3)

And I might add from his personal standpoint that he does live within just a few miles of the plant up in Fort Calhoun. (FCS-E-3)

Comment: I've been with the Chamber for 16 years now, and I have found that OPPD has been a wonderful corporate citizen. We have found that they are just extremely responsive to the needs of the community and particularly the business community that I represent.

OPPD has also been key to our area's economic-development efforts, and this is one area that I can certainly speak to since the Omaha Chamber is one of the lead entities in the economic-development arena for our community.

OPPD's competitive electric rates have been extremely important in the attraction and retention of new and existing industry, and the relicensing of the Fort Calhoun plant is an extremely important factor in keeping our local electrical rates competitive with other metropolitan areas, as well as providing the reliability and dependability of electrical service that businesses today require. (FCS-F-1)

Comment: For over 30 years, the Omaha Public Power District has proven to be a very good corporate partner with UNMC [University of Nebraska Medical Center]. OPPD has supported and co-funded the regional Radiation Health Center at UNMC. The purpose of the Radiation Health Center is to provide specialized medical services related to the evaluation, treatment and management of individuals exposed to radioactive materials.

Through OPPD support of our health center, UNMC has been able to obtain state-of-the-art radiation detection equipment and instrumentation. The Radiation Health Center and the Nuclear Medical Division of the Nebraska Health System [NHS] and UNMC's College of Pharmacy and College of Medicine are able to utilize this equipment for routine patient care and medical research whenever the facility and instrumentation are not being utilized for radiation accident patients.

In fact, the routine use of instrumentation by UNMC and NHS is primarily how it is utilized. Among the list of instrumentation that OPPD support has contributed to includes a gamma camera, which has been for nuclear medicine imaging of patients, high purity germanium lithium detector used in research for analysis of radiative samples and various computers; radiation survey meters; and personnel monitoring devices used in monitoring patients and equipment. (FCS-G-1) (FCS-AA-1)

Comment: The Fort Calhoun Nuclear Power Station employs 651 residents as part of its regular remanding table. As the regular remanding payroll, $46.1 million, Fort Calhoun payroll has the potential to generate $3 million in tax revenue. In addition to Fort Calhoun's regular remanding table, the last refueling outage resulted in an additional 592 jobs that produced $13.8 million in wages and tax revenue potential of $897,000. That would be a grand total of $4 million in potential tax revenue in our area. (FCS-I-1)

Comment: Fort Calhoun also contributes to the social fiber of our community. The Salvation Army, the Boy Scouts, the Girl Scouts, and other charitable organizations, as well as houses of worship, are able to provide programs that benefit our community, thanks in part, to Fort Calhoun's continued ability to provide good jobs.

Local public schools, as well as the Nebraska University system, the Metro Community College benefit from Fort Calhoun's continued operation. As a part of the OPPD, Fort Calhoun played a key role in raising $250,000 in last year's United Way Midland's drive, which is extremely important to our community in raising dollars for charitable organizations in our community.

Over the last year, the Omaha labor movement and Fort Calhoun have played and developed a spirit of cooperation on a series of levels in order to operate more safely and proficiently during the fueling outages at Fort Calhoun. Labor and management have taken new innovative approaches to reduce the redundant fees spent on background investigations. In addition,

labor and management are working together to provide training offsite. Offsite training reduces the need of additional badging, which creates a more secure work environment and also reduces man-hours. In an effort to make refueling outages shorter, safer, and more proficient, Fort Calhoun and local labor-leader organizations have taken steps to ensure that there will be a trained and ready workforce to assist Fort Calhoun with refueling outages.

I have had the opportunity to work with the Fort Calhoun employees as a part of my responsibilities as a labor leader. I have found each of them take pride in everything they do; each are extremely knowledgeable in their job, and each acknowledge that safety is woven into every factor of their jobs. And I believe this is an excellent reflection of Fort Calhoun's management.

…It's because of that continued effort of business and labor working together in the management of that facility that I think has brought about a tremendous end in what has happened in the last fueling outage. We had 30 days scheduled in that facility. I'm happy to tell you that we did that in 29 days, 3 hours and 19 minutes under the called time and further to tell you that I'm extremely happy to say there was not one grievance filed by one worker. There wasn't one stoppage or one slowdown on any part of this job, and I think that is a great credit to the workers of OPPD and the management that has worked diligently to make sure we forge a long lasting relationship. Thank you. (FCS-I-2)

Comment: Many of the employees from the Fort Calhoun Nuclear Station and their families live and work in local communities surrounding the nuclear power station. These people participate in local religious and service organizations that benefit the communities they live in and the State of Nebraska. They also participate in and support local schools and local governments. As these employees and their families live in surrounding communities, they have a strong incentive to ensure the continued safe operation of the nuclear station and the station's continued efforts to preserve the quality of life and environment.

As described, it can be seen that the Fort Calhoun Nuclear Station and its staff are a large and beneficial part of the local economy**.** (FCS-K-2) (FCS-Y-2)

Comment: Actually, Omaha Public Power District has been not only a monetary member of ours, but also has been a big volunteer member of our organization from that. In that, Roger Christianson, the Director of Economic Development, serves on our Executive Board and our Board of Directors. And many of the economic-development staff and other staff of OPPD are involved in many of our activities, especially with recruitment of industry. (FCS-O-1)

Comment: Our mission is the creation of jobs and the creation of new net investment into Sarpy County. I think as some of you know, we're the third fastest growing county in the State of Nebraska. The last five years we have averaged over 1000 new single-family housing units that have been built in Sarpy County.

I think it's safe to say in the Omaha metropolitan area that we are the largest provider of industrial and business sites in the Omaha metropolitan area. We currently have on inventory over 30 business, industrial, commercial, and office parks for location.

One of the things that we are seeing with regard to our development is a number of very large projects that are locating in Sarpy County. I'll give you a couple of examples. The Caterpillar Claus that goes by Claus Omaha right now located within Sarpy County within the last year. Shopco's Warehouse Distribution Center located in Sarpy County about a year ago. And Nebraska Machinery relocated from the downtown area of Omaha into Sarpy County. So those are three of our major projects that located in Sarpy County within the last year.

One of the things that we are seeing from our prospects is that they are looking for reliable electrical power. A lot of those companies are looking for redundant feeds. They're looking for feeds coming from two different substations because they want reliability, especially in the days of very high technical computer operations.

One of the things I think that ties to that is also the ability to provide a number of different sources to create that electrical power. Whether that be wind, nuclear, coal, oil, I think it's very, very important that we maintain and are looking at a wide variety of ways to generate electrical power.

We're going to continue to grow. Certainly, growth is very important to our state. I guess most of you know our legislature is being called back because our economic projections are about 120 million (dollars) lower than what they should be. And as a result of that, they are going to have to be cutting a number of major projects. That's why economic growth and the value of projects is very important to continue to grow our assessed valuation in the community.

So we are certainly very much in support of having a variety of sources available and reliable sources available for power for not only our residents but our new industries and businesses that locate within Sarpy County.

So I appreciate the opportunity to speak on record. (FCS-O-2)

Comment: In addition, our homes and families are in this area. We contribute to the community with our volunteer work and our social leadership. It's also not surprising when you consider the fact that we are owned by the people of the community who buy power from us.

As you might know, Nebraska is unique among the 50 states. We have a total public power picture in Nebraska. Whether it's a public power district like OPPD or a municipally owned organization, they're all publicly owned.

Nebraskans take a great deal of pride in this uniqueness and also in the fact that they own the organizations that provide their power. Our customers elect a Board of Directors. At the earlier meeting today, Anne McGuire, who is Chairman of our Nuclear Oversight Committee, attended and will report back to the Board independently on the proceedings that she observed.

We enjoy great support from our Board, as well as the other senior-management group at Fort Calhoun — or at OPPD. (FCS-P-2)

Comment: We also know that to successfully operate a nuclear power plant you must do so economically. Fort Calhoun Station is an economical source of electricity for our customers, and its cost-effectiveness continues to improve.

We recently completed the most efficient refueling outage in the history of the plant. It's a tribute to the workers at the plant, the skilled labor that is available in the Omaha area, and all the support for Fort Calhoun in the community. Looking ahead, we see a continuing improvement in the area of cost-effectiveness.

As we go forward with the license renewal for Fort Calhoun, our commitment remains continuous and the same. We have submitted our license renewal application in January, it was reported. We continue to update the plant to keep it current in its equipment needs. And we look forward to the license renewal process. (FCS-P-4)

Comment: In addition to being a safely operated facility, Fort Calhoun's operations is benefitting the community in the forms of jobs, payments in lieu of taxes, and community service. Continued operation would support the continuation of these benefits. (FCS-Q-8)

Comment: We have a great working relationship with Fort Calhoun Station. And because of their philosophy of providing continuing education to the response organizations, we have advanced from basic first aid in the 1960s and early 1970s to having people now providing advanced life support with being able to start IVs and also treat trauma patients and cardiac patients, which may occur at either Fort Calhoun Station or anywhere else in our responding area.

Another thing is — that we found is OPPD and Fort Calhoun Station have always been good neighbors for Blair, Nebraska, in Washington County. The Blair Rescue Squad feels that the continued relationship with this organization is paramount as part of our community service to Washington County.

Fort Calhoun's management has always encouraged their personnel to be involved in community service and projects, and also be involved in groups such as fire departments and rescue squads. Over the past 25 years, Fort Calhoun employees have volunteered as firefighters and EMTs in Blair, Nebraska; Fort Calhoun, Nebraska; Kennard, Nebraska; Arlington; Tekamah; and Herman.

Now, we also have not just been involved in the organizations as far as being volunteers and firefighters and rescue squads. We have two individuals that have served as fire chiefs. We have assistant fire chiefs, as well as rescue and fire captains on all of these organizations.

The work by these individuals has also helped shape the Nebraska State Fire Service, which is our governing body for providing our regulation and guidelines on how we respond to activities in the state. And we have done that by having people serve on the national — on our State board as well as also teaching classes at Nebraska State Fire School.

I guess we'd have to say, really and truly, the Fort Calhoun Station has been a driving force in Washington County for individuals that are involved in the fire and the rescue services. And its personnel is the best in the nuclear industry, and we feel that a license renewal would really impact our communities in a very positive sort

Now, that's one side of the situation. The other situation is I've been an employee of Omaha Public Power District for 32 years. I have the oldest active license on the Fort Calhoun Station. And because of Fort Calhoun and Omaha Public Power District, I've been able to be involved in the rescue services and the fire services and continue a tradition started by my family over 50 years ago.

I'm going to retire soon. I know you don't like to hear that. But I'd love to see Fort Calhoun continue to operate for an additional 20 years. And with input from the people that we have here, and with the people that are at Fort Calhoun Station, I see that as a very viable option for power production in Nebraska. (FCS-R-1)

Comment: When people get up at this podium and push economic progress through that plant, that's the gravest — as a businessperson, for my entire life, my family has been involved in business my entire life. Not the ministry, not education, we've been businesspeople forever and ever. No one could advocate that.

My grandfather couldn't advocate financing a power plant through his banks. My father could not advocate it through energy sales. It's just impossible for somebody from an economic-development group to say, "This is good for our area. It's so out of sight." I would love to have you explain that to my grandson in 25 years when we've produced thousands of pounds of more radioactive waste that are going to be sitting some place; we don't even know where.

Yucca Flats, with a 4.6 on the Richter scale — and I'm — my voice is getting emotional now, and I'm trying to avoid that. The risk is too great. You can't have it.

Speaking to OPPD now, speaking to the nuclear regulatory people now, and I'm speaking to those disinterested people, who, I guess, are not disinterested because they're here tonight.

No matter what the economic gain is, it's not enough. It's not enough. If we have to go without electricity for two years, if we have to go without, then we have to go without. You can't risk that catastrophic event. You cannot risk it.

And I'll leave that — those words with you again. The risk is too great, not for myself — I've got 20 more years to live. I'm 59. By statistics, I'll live 20 more years. My grandchildren, their grandchildren, and their grandchildren, you have this tremendous weight — not weight. You have this tremendous power over their heads, and it's not something that could happen slowly. The exposure — the death comes very, very quickly. (FCS-T-7)

Comment: One thing I read recently was that — or heard that energy or a nuclear power plant is liable for roughly $9 billion in terms — in the event of a meltdown. The average cost of a meltdown, for recovery, would be $110 billion. In terms of socioeconomic effects, I think that's a pretty serious effect.

I know — I don't think it's exactly worth 30 percent of our energy use. I don't think $100 billion should be passed on to any energy consumer. (FCS-W-1)

Comment: The management and employees of OPPD have a long history of civic involvement in our community. Last year alone they contributed over $290,000 to the United Way campaign. The average gift per employee is well above our community average. Employees at Fort Calhoun contributed nearly a third of this total.

OPPD employees freely volunteer their time and talent to a wide array of important charitable and civic efforts in our community. These gifts of time and money have a significant positive impact on the quality of life in our community, addressing issues as diverse as early childhood education, and public safety. (FCS-AC-1)

Response: *The comments are noted. Most of the comments are supportive of license renewal for Fort Calhoun Station, Unit 1. Public services involving public safety, social services, tourism and recreation, and education were evaluated in the GEIS and were determined to be Category 1 issues. The comments provide no new information on these public-service issues and, therefore, will not be evaluated further.*

6. Comments Concerning Category 2 Socioeconomic Issues

As stated in 10 CFR Part 51, Table B-1, Category 2 socioeconomic issues include the following:

- Housing impacts
- Public services: public utilities
- Public services, education (refurbishment)
- Offsite land use (refurbishment)
- Offsite land use (license renewal term)
- Public services, transportation
- Historic and archaeological resources

Comment: We also interface with the State Historical Preservation Office and have confirmed that continued operations would not impact any historical or archaeological resources. (FCS-D-6)

Comment: We also interfaced with the State Historical Preservation Office and confirmed that the continued operation would not impact any historical or archaeological resources. (FCS-Q-6)

Response: *The comments are noted. Historic and archaeological resource issues related to the renewal period were evaluated in the GEIS and were determined to be a Category 2 issue. The comments provide no new information; however, NRC consultation with the State Historic Preservation Office (SHPO) is discussed in Chapter 4 of the SEIS.*

7. Comments Concerning Category 2 Threatened-or-Endangered-Species, Aquatic-Ecology, or Terrestrial-Resources Issues

As stated in 10 CFR Part 51, Table B-1, Category 2 threatened-or-endangered-species, aquatic-ecology, or terrestrial-resources issues include such matters as the following:

- Threatened or endangered species
- Entrainment of fish and shellfish in early life stages
- Impingement of fish and shellfish
- Heat shock

Comment: In the area of plants and animals, reviews of internal documentation and observations indicate that there are no threatened or endangered species at the site and on our associated transmission line rights-of-way. Interfaces and consultations with the U.S. Fish and Wildlife Service and both the Nebraska and Iowa Departments of Natural Resources supported these findings. NRC will be entering into formal consultations with these agencies under the Endangered Species Act during the development of their environmental impact statement. (FCS-D-3)

Comment: But at that time, I participated in the writing of the environmental impact statement for Fort Calhoun Station. In the following 10 years, due to the mandated pre- and post-operational studies that were associated with the granting of the original license, I participated in a very large number of reports, data gathering, information exchanges, which involved people from an entire community that sprang up at that time. These were the individuals who had expressed concerns about environmental effects of the plant.

They were the investigational groups from, for example, the University of Nebraska, Nebraska Game and Parks Commission, EPA, States of Missouri, Iowa. A whole community of interested people began studying the Missouri River, and it's that particular area that I would like to bring to the attention of the people who will be making decisions concerning the environmental impact.

The volume of productivity at that time was astronomical. It was absolutely an unprecedented outpouring of investigation on a stretch of a river that up to that time had received practically no attention. The period prior to that has given rise to a misconception. I would guess that if you were to ask an academic anywhere in this area what is known about the Missouri River, the answer would be nothing.

There is a confusion, a lack of information, that has become embedded in what we might refer to then as the common wisdom, that the Missouri River is a desert in terms of investigational enthusiasm that nobody knows anything about it, and, therefore, the conclusion might rapidly

be drawn that any activity on the river will have a variety of unforeseen effects because if you don't know what is there, you obviously cannot figure out what might happen.

Well, my remarks today are designed to eliminate that misconception. The river is thoroughly understood in a variety of ways. To start off with fisheries – the fisheries have been investigated over a period of approximately 50 years, starting off slowly, but then building at an enormous level of investigational studies. If you're interested in zooplankton, phytoplankton, macroinvertebrates, insect larvae, if you like larval fish, the distribution of eggs, from upstream hatchery areas down the river, if you are fascinated by impingement, entrainment, any of the things that you can think of, they have been done. They have been done in enormous detail.

I'm assuming that those of you who are specifically charged with this know all the documents. However, there is a shortcut to getting to them if you do not know them all. I said that a community of investigators had sprung up. We met one another constantly at hearings, at meetings, at exchanges of information over a period of 12 years. People from Nebraska, Creighton University, University of Nebraska, a variety of other agencies. And met one another and typically they were in adversarial positions.

These were people who took opposite sides on practically everything. At the end of that period of time, we were all sitting down at lunch, and I said, "Isn't it a shame that at the end of this, this enormous amount of investigation is going to disappear into file cabinets, internal documents, rarely seen publications, and none of it will ever have been pulled together."

We agreed. There were five of us who agreed to do the heavy lifting. We said we will meet, and we met over a period of three years weekly in the library of Nebraska Game and Park Commission Office in Lincoln. The "we" – incidentally, if you're interested in names — were Larry Hesse, Gary Hargenradar, Howard Lewis, Steven Reeds, and myself.

We pulled together all of that information and asked the people who had done the work over that period of time to write, and it came out to be 11 or 12 chapters on all the various subdivisional portions of the investigation. (FCS-N-1)

Comment: Thermal plume effects. We asked the Corps of Engineers to give us a chapter on the structural changes that have been brought about by the levy construction, dike construction. We asked them to pull out all of the information that would be critical to comprehending cross-channel distributions, rates of flow and then put into those figures the distributional patterns for such things as larval fish drifts and so on.

If you think that you can drop a hoop net some place in the river, pull out a sample, and extrapolate to the distribution, just multiply your figure out by a cross section, you're wrong. You're wrong by so much that you probably will be embarrassed by somebody who knows that

there is a stratification, both vertically and horizontally, throughout every portion of the river.

The organisms do not follow the malted-milk-mixing pattern. They are very specifically distributed. All of that stuff is available. It's in a book; we put out a book. It's called *The Middle Missouri River*. It's available in every library in this area, most of the universities. I've called it to your attention. It'll make your life a lot easier if you take some time to look at what was done 30 years ago. (FCS-N-2)

Comment: In the area of plants and animals, reviews of internal documentation and observations indicated that there are no threatened or endangered species at the site or on our associated transmission rights of way. Interfaces and consultations with the U.S. Fish and Wildlife Service, and both the Nebraska and Iowa Departments of Natural Resources, supported these findings.

The NRC will be entering into formal consultations with these agencies under the Endangered Species Act during the development of the supplemental environmental impact statement. (FCS-Q-3)

Comment: The second point is — or the second topic that I wanted to discuss was environmental impact. Recently, the Army Corps of Engineers is looking to change their manipulation of the Missouri River. There is a lobby against changing it from the power associations because they require high levels of water in the river during the summer to cool down the plants.

In turn, this basically greater — or it threatens seriously endangered species, including the pallid sturgeon and the piping plover. (FCS-W-2)

Response: *The comments are noted. The comments relate to aquatic- and terrestrial-ecology issues and have been considered in the preparation of the SEIS. NRC consultation with the U.S. Fish and Wildlife Service (FWS) is discussed in Chapter 4 of the SEIS.*

8. <u>Comments Concerning Alternatives</u>

Comment: We also are in an earthquake belt in this area. There was a catastrophic earthquake in 1803. There was an earthquake in Clarkson, Nebraska, just two or three years ago. That's a possibility. If we had an oil-fired plant, a gas-fired plant, a coal-fired plant, who cares? The plant is shut down for two or three days, you repair the cracks in the walls, and you go on. You can't do that with a nuclear power plant. The risk is too grave. (FCS-T-4)

Comment: And conservation is another issue that — California recently was in an energy crisis, and it quickly had to cut energy use, so they cut it 15 percent in a year. When will the

utility embark on an aggressive campaign of conservation? When will we put some energy and money into making it so we don't have to generate so much energy? (FCS-U-3)

Comment: Maybe that doesn't sound like a lot, but wind generators have nothing like this. There is no waste. There is no — there is no body count. And this is the last thing I want to give you. This was produced basically by the Union of Concerned Scientists to demonstrate that, yes, we are the windiest region on earth.

Yes, we can have wind generators. Yes, nobody will sell us wind. That's why there isn't a built-in lobby pushing this technology. But I think it's time we all wake up and give up on a technology that has a body count. (FCS-U-10)

Response: *The comments are noted. Environmental impacts from reasonable alternatives to the Fort Calhoun Station, Unit 1 license renewal are evaluated in Chapter 8 of the SEIS.*

9. Comments Concerning Postulated-Accident Issues

As stated in 10 CFR Part 51, Table B-1, Category 1 postulated accidents issues include design basis accidents. In addition, the staff identified environmental impacts of design basis accidents as a Category 1 issue in the GEIS. Further, the Commission has determined that the probability-weighted environmental consequences from severe accidents (i.e., beyond design basis accidents) are small for all plants, but that alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives. See 10 CFR 51.53(c)(3)(iii)(L).

Comment: There was an earthquake near Yucca Flats the other day of 4.6. We also are in an earthquake belt in this area. There was a catastrophic earthquake in 1803. There was an earthquake in Clarkson, Nebraska, just two or three years ago. That's a possibility. (FCS-T-4)

Comment: …[A]nd this is about the risk-assessment science, which is — underestimates the risk of an accident, a catastrophic accident by at least 100 percent.

An accident in an U.S. nuclear power plant could kill more people than were killed by the atomic bomb dropped on Nagasaki. The financial repercussions could also be catastrophic. The 1986 accident at the Chernobyl nuclear plant cost the former Soviet Union more than three times the economic benefits accrued from the operation of every other nuclear — Soviet nuclear power plant that they operated than in the entire lifetime.

But the consequences alone do not define risk. The probability of an accident is equally important. When consequences are very high, as they are for nuclear-plant accidents, prudent risk management dictates that probabilities be kept very low. The NRC attempts to limit the risk

to the public from nuclear-plant operation to less than one percent of the risk the public faces from other accidents.

Well, nuclear-plant assessments are not really — are really not risk assessments because potential accidents consequences are not evaluated. They merely examine accident probabilities — only half of the risk equation. Moreover, the accident probability calculations are seriously flawed. They rely on assumptions that contradict actual operating experience.

The risk assessments assume nuclear plants always conform with safety requirements, yet each year more than a thousand violations are reported. (FCS-U-7)

Response: *The comments are noted. Design-basis and severe accidents, including events initiated by earthquakes, were evaluated in the GEIS, and the impacts were determined to be small for all plants. A site-specific analysis of severe accident mitigation alternatives (SAMAs) for Fort Calhoun Station, Unit 1 has been performed by the NRC staff within the environmental analysis in Chapter 5 of the SEIS. This analysis considered both the probability and the consequences of severe accidents and evaluated the means to prevent or mitigate these events. The comments provide no new information and will not be evaluated further in the context of the environmental review.*

Part II – Comments Received on the Draft SEIS

Pursuant to 10 CFR Part 51, the staff transmitted the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Regarding Fort Calhoun Station, Unit 1 Draft Report for Comment* (NUREG-1437, Supplement 12, referred to as the draft SEIS) to Federal, State, and local government agencies; certain Indian tribes; and interested members of the public. As part of the process to solicit public comments on the draft SEIS, the staff:

- placed a copy of the draft SEIS into the NRC's Public Electronic Recording Room, its license renewal website, and at the Blair Public Library in Washington County, Nebraska, and at the W. Dale Clark Library in Omaha, Nebraska

- sent copies of the draft SEIS to the applicant, members of the public who requested copies, representatives of certain Indian tribes, and certain Federal, State, and local agencies

- published a notice of availability of the draft SEIS in the Federal Register on January 14, 2003 (68 FR 1873)

- issued public announcements, such as advertisements in local newspapers and postings in public places, of the availability of the draft SEIS

- announced and held two public meetings in Omaha, Nebraska on February 26, 2003, to describe the results of the environmental review and answer related questions

- issued public service announcements and press releases announcing the issuance of the draft SEIS, the public meetings, and instructions on how to comment on the draft SEIS

- established an email address to receive comments on the draft SEIS through the Internet.

During the comment period, the staff received a total of three comment letters in addition to the comments received during the public meetings.

The staff has reviewed the public meeting transcripts and the three comment letters that are part of the docket file for the application, all of which are available in the NRC's electronic Public Document Room. Appendix A, Part II, Section A.1 contains a summary of the comments and the staff's responses. Related issues are grouped together. Appendix A, Part II, Section A.2 contains excerpts of the February 26, 2003, public meeting transcripts and comment letters.

Each comment identified by the staff was assigned a specific alpha-numeric identifier (marker). That identifier is typed in the margin of the transcript or letter at the beginning of the discussion of the comment. A cross-reference of the alpha-numeric identifiers, the speaker or author of the comment, the page where the comment can be found, and the section(s) of this report in which the comment is addressed is provided in Table A-2. The speakers at the meetings are listed in speaking order along with the page of the transcript excerpts in this report on which the comment appears. These comments are identified by the letters "FCSD" followed by a number that identifies each comment in approximate chronological order in which the comments were made. The written comment letters are also identified by the letters "FCSD".

The staff made a determination on each comment that it was one of the following:

(1) a comment that was actually a request for information and introduced no new information.

(2) a comment that was either related to support or opposition of license renewal in general (or specifically Fort Calhoun Station, Unit 1) or that made a general statement about the license renewal process. It may have made only a general statement regarding Category 1 and/or Category 2 issues. In addition, it provided no new information and does not pertain to 10 CFR Part 54.

(3) comment about a Category 1 issue
   (a) that provided new information that required evaluation during the review, or
   (b) provided no new information

(4) a comment about a Category 2 issue that
   (a) provided information that required evaluation during the review, or
   (b) provided no such information

(5) a comment that raised an environmental issue that was not addressed in the GEIS or the DSEIS

(6) a comment on safety issues pertaining to 10 CFR Part 54

(7) a comment outside the scope of the license renewal (not related to 10 CFR Parts 51 or 54), or

(8) Editorial in nature.

There was no significant new information provided on Category 1 issues [(3)(a) above] or information that required further evaluation on Category 2 issues [(4)(a)]. Therefore, the conclusions in the GEIS and draft SEIS remained valid and bounding, and no further evaluation was performed.

Comments without a supporting technical basis or without any new information are discussed in this appendix, and not in other sections of this report. Relevant references that address the issues within the regulatory authority of the NRC are provided where appropriate. Many of these references can be obtained from the NRC Electronic Public Document Room.

Within each section of Part II of this appendix (A.1.1 through A.1.7), similar comments are grouped together for ease of reference, and a summary description of the comments is given, followed by the staff's response. Where the comment or question resulted in a change in the text of the draft report, the corresponding response refers the reader to the appropriate section of this report where the change was made. Revisions to the text in the draft report are designated by vertical lines beside the text.

Table A-2. Fort Calhoun Station, Unit 1 SEIS Comment Log

Commenter ID	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
FCSD-A-1	G. Gates	Afternoon Meeting Transcript (02/26/03)	A-30	A.1.1
FCSD-A-2	G. Gates	Afternoon Meeting Transcript (02/26/03)	A-31	A.1.2
FCSD-A-3	G. Gates	Afternoon Meeting Transcript (02/26/03)	A-30	A.1.1

Commenter ID	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
FCSD-A-4	G. Gates	Afternoon Meeting Transcript (02/26/03)	A-32	A.1.2
FCSD-B-1	G. Gates	Evening Meeting Transcript (02/26/03)	A-30	A.1.1
FCSD-B-2	G. Gates	Evening Meeting Transcript (02/26/03)	A-32	A.1.2
FCSD-B-3	G. Gates	Evening Meeting Transcript (02/26/03)	A-30	A.1.1
FCSD-B-4	G. Gates	Evening Meeting Transcript (02/26/03)	A-32	A.1.2
FCSD-C-1	R. Hall	Evening Meeting Transcript (02/26/03)	A-31	A.1.1
FCSD-D-1	S.K. Gambhir	April 4, 2003, Letter	A-46	A.1.4
FCSD-D-2	S.K. Gambhir	April 4, 2003, Letter	A-50	A.1.6
FCSD-D-3	S.K. Gambhir	April 4, 2003, Letter	A-50	A.1.6
FCSD-D-4	S.K. Gambhir	April 4, 2003, Letter	A-50	A.1.6
FCSD-D-5	S.K. Gambhir	April 4, 2003, Letter	A-36	A.1.3
FCSD-D-6	S.K. Gambhir	April 4, 2003, Letter	A-51	A.1.6
FCSD-D-7	S.K. Gambhir	April 4, 2003, Letter	A-51	A.1.6
FCSD-D-8	S.K. Gambhir	April 4, 2003, Letter	A-51	A.1.6
FCSD-D-9	S.K. Gambhir	April 4, 2003, Letter	A-52	A.1.6
FCSD-D-10	S.K. Gambhir	April 4, 2003, Letter	A-51	A.1.6
FCSD-D-11	S.K. Gambhir	April 4, 2003, Letter	A-51	A.1.6
FCSD-D-12	S.K. Gambhir	April 4, 2003, Letter	A-36	A.1.3
FCSD-D-13	S.K. Gambhir	April 4, 2003, Letter	A-36	A.1.3
FCSD-D-14	S.K. Gambhir	April 4, 2003, Letter	A-37	A.1.3
FCSD-D-15	S.K. Gambhir	April 4, 2003, Letter	A-37	A.1.3
FCSD-D-16	S.K. Gambhir	April 4, 2003, Letter	A-37	A.1.3
FCSD-D-17	S.K. Gambhir	April 4, 2003, Letter	A-37	A.1.3
FCSD-D-18	S.K. Gambhir	April 4, 2003, Letter	A-37	A.1.3
FCSD-D-19	S.K. Gambhir	April 4, 2003, Letter	A-47	A.1.4

Commenter ID	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
FCSD-D-20	S.K. Gambhir	April 4, 2003, Letter	A-51	A.1.6
FCSD-D-21	S.K. Gambhir	April 4, 2003, Letter	A-33	A.1.2
FCSD-D-22	S.K. Gambhir	April 4, 2003, Letter	A-33	A.1.2
FCSD-D-23	S.K. Gambhir	April 4, 2003, Letter	A-51	A.1.6
FCSD-D-24	S.K. Gambhir	April 4, 2003, Letter	A-51	A.1.6
FCSD-D-25	S.K. Gambhir	April 4, 2003, Letter	A-51	A.1.6
FCSD-D-26	S.K. Gambhir	April 4, 2003, Letter	A-35	A.1.2
FCSD-D-27	S.K. Gambhir	April 4, 2003, Letter	A-37	A.1.3
FCSD-D-28	S.K. Gambhir	April 4, 2003, Letter	A-33	A.1.2
FCSD-D-29	S.K. Gambhir	April 4, 2003, Letter	A-33	A.1.2
FCSD-D-30	S.K. Gambhir	April 4, 2003, Letter	A-35	A.1.2
FCSD-D-31	S.K. Gambhir	April 4, 2003, Letter	A-36	A.1.2
FCSD-D-32	S.K. Gambhir	April 4, 2003, Letter	A-33	A.1.2
FCSD-D-33	S.K. Gambhir	April 4, 2003, Letter	A-35	A.1.2
FCSD-D-34	S.K. Gambhir	April 4, 2003, Letter	A-35	A.1.2
FCSD-D-35	S.K. Gambhir	April 4, 2003, Letter	A-47	A.1.5
FCSD-D-36	S.K. Gambhir	April 4, 2003, Letter	A-47	A.1.5
FCSD-D-37	S.K. Gambhir	April 4, 2003, Letter	A-48	A.1.5
FCSD-D-38	S.K. Gambhir	April 4, 2003, Letter	A-48	A.1.5
FCSD-D-39	S.K. Gambhir	April 4, 2003, Letter	A-34	A.1.2
FCSD-D-40	S.K. Gambhir	April 4, 2003, Letter	A-34	A.1.2
FCSD-D-41	S.K. Gambhir	April 4, 2003, Letter	A-48	A.1.5
FCSD-D-42	S.K. Gambhir	April 4, 2003, Letter	A-48	A.1.5
FCSD-D-43	S.K. Gambhir	April 4, 2003, Letter	A-48	A.1.5
FCSD-D-44	S.K. Gambhir	April 4, 2003, Letter	A-48	A.1.5

Commenter ID	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
FCSD-D-45	S.K. Gambhir	April 4, 2003, Letter	A-49	A.1.5
FCSD-D-46	S.K. Gambhir	April 4, 2003, Letter	A-49	A.1.5
FCSD-D-47	S.K. Gambhir	April 4, 2003, Letter	A-49	A.1.5
FCSD-D-48	S.K. Gambhir	April 4, 2003, Letter	A-49	A.1.5
FCSD-D-49	S.K. Gambhir	April 4, 2003, Letter	A-49	A.1.5
FCSD-D-50	S.K. Gambhir	April 4, 2003, Letter	A-34	A.1.2
FCSD-D-51	S.K. Gambhir	April 4, 2003, Letter	A-49	A.1.5
FCSD-D-52	S.K. Gambhir	April 4, 2003, Letter	A-34	A.1.2
FCSD-D-53	S.K. Gambhir	April 4, 2003, Letter	A-49	A.1.5
FCSD-D-54	S.K. Gambhir	April 4, 2003, Letter	A-49	A.1.5
FCSD-D-55	S.K. Gambhir	April 4, 2003, Letter	A-34	A.1.2
FCSD-D-56	S.K. Gambhir	April 4, 2003, Letter	A-50	A.1.5
FCSD-D-57	S.K. Gambhir	April 4, 2003, Letter	A-50	A.1.5
FCSD-D-58	S.K. Gambhir	April 4, 2003, Letter	A-50	A.1.5
FCSD-D-59	S.K. Gambhir	April 4, 2003, Letter	A-34	A.1.2
FCSD-D-60	S.K. Gambhir	April 4, 2003, Letter	A-46	A.1.4
FCSD-E-1	R.F. Stewart	April 1, 2003, Letter	A-38	A.1.3
FCSD-E-2	R.F. Stewart	April 1, 2003, Letter	A-38	A.1.3
FCSD-E-3	R.F. Stewart	April 1, 2003, Letter	A-39	A.1.3
FCSD-E-4	R.F. Stewart	April 1, 2003, Letter	A-40	A.1.3
FCSD-E-5	R.F. Stewart	April 1, 2003, Letter	A-40	A.1.3
FCSD-E-6	R.F. Stewart	April 1, 2003, Letter	A-40	A.1.3
FCSD-E-7	R.F. Stewart	April 1, 2003, Letter	A-52	A.1.7
FCSD-F-1	U.G. Hutton	April 10, 2003, Letter	A-44	A.1.3
FCSD-F-2	U.G. Hutton	April 10, 2003, Letter	A-44	A.1.3

Commenter ID	Speaker or Author	Source	Page of Comment	Section(s) Where Addressed
FCSD-F-3	U.G. Hutton	April 10, 2003, Letter	A-52	A.1.7
FCSD-F-4	U.G. Hutton	April 10, 2003, Letter	A-45	A.1.3
FCSD-F-5	U.G. Hutton	April 10, 2003, Letter	A-45	A.1.3

A.1 Comments and Responses

A.1.1 General Comments in Support of License Renewal at Fort Calhoun Station, Unit 1

Comment: As stated, my name is Gary Gates. ... I spoke to you in June, at the June meeting in Omaha concerning our license renewal application, I welcome the opportunity to do so again today in support of the preliminary conclusions of the NRC staff that there are no environmental impacts to preclude renewal of the operating license for Fort Calhoun Station. (FCSD-A-1)

Comment: We feel that over the last 30 years we have demonstrated a high level of safety and environmental stewardship with all of our programs and operations. In fact, the continued safe operation of Fort Calhoun Station remains the number one priority at OPPD. OPPD maintains its facilities and conducts its operation based on a strong commitment to environmental monitoring and management. Our policy is to conduct operations, not just in compliance with all applicable government laws and regulations, but over and beyond minimum requirements for those regulations. This ensures our ability to protect the environment and to serve in the best interest of our employees, our customers, and surrounding community.

We feel the NRC staff recommendation, which the subject of today's meetings, is a testament to the effectiveness of that approach. OPPD will continue what we believe is a comprehensive environmental monitoring program, hopefully for an additional 20 years of operation from 2013.

Furthermore, we will continue to develop and implement ways to further minimize the risks associated with operation of a nuclear plant. In other words, we are committed to conducting our operations in an environmentally responsible manner as we have done for the last 30 years. (FCSD-A-3)

Comment: My name's Gary Gates. ... I spoke at your June meeting in Omaha concerning the license renewal application, and I welcome the opportunity to speak this evening in support of the conclusion reached by the NRC, but there are no environmental impacts that preclude the

renewal of the operating devices of the Fort Calhoun nuclear plant. (FCSD-B-1)

Comment: We feel that over the last 30 years we have demonstrated a high level of safety and environmental stewardship in all our programs and operations.

In fact, the continued safety operation of Fort Calhoun Station remains the number one priority of OPPD. OPPD maintains its facilities and conducts its operations based on a strong commitment to the environment and monitoring and the management of those policies. Our policy is to conduct operations, not just in compliance with all applicable government laws and regulations, but over and beyond minimum requirements of those regulations. This ensures our ability to protect the environment and to serve in the best interest of our employees, our customers and the surrounding communities. We feel the NRC staff recommendation, which is the subject of today's meeting, is a testament to the effectiveness of our approach.

OPPD will continue, what we believe, is a comprehensive, environmental monitoring program, hopefully for an additional 20 years, beyond 2013.

Furthermore, we will continue to develop and implement ways to enhance the operation of Fort Calhoun Station. In other words, we are committed to conducting our operations in an environmentally responsible manner as we have done in the last 30 years. (FCSD-B-3)

Comment: My name is Rob Hall, and I represent the Omaha — Greater Omaha, Nebraska, and Southwest Iowa Building and Trade. ... Today we are working hand in hand with OPPD to come up with some new innovative ways to — for labor to help them and for them to help labor in the community. It's a great tribute to the leadership and management at this facility. And that goes from the managers to the planners to the training department. It's unbelievable the ground we've covered and the issues we discussed.

One of them, of course, is safety. And we're working on several issues there. I can speak from my trade union, which is the Asbestos Workers and the Piping Slayers, and we've dealt with asbestos within the OPPD system for years. And we've never ever had any problems, any complaints. They're a group that is so well organized and so well planned, we've never had any problems with any type of removal project. It's a great place to work. It truly is. And again, that's attributed to the leadership and management. So without repeating myself, I thank you for the opportunity to address the NRC. And again, OPPD is an important part of our industry. (FCSD-C-1)

Response: *The comments are noted. The comments are supportive of license renewal at Fort Calhoun Station, Unit 1, and are general in nature. The comments provide no new information; therefore, the comments were not evaluated further. There was no change made to the SEIS text.*

A.1.2 Comments Concerning Socioeconomic Issues

Comment: OPPD provides electricity to more than 300,000 customers in a 13-county area in southeast Nebraska. It must be noted that 30 percent of this generation for those customers is generated at the Fort Calhoun Station. Fort Calhoun's a single unit plant located between Blair and Fort Calhoun and was declared operational and commercial in 1973, and has been operating safely since then. (FCSD-A-2)

Comment: Let me take a few minutes to say something about the employees who work at Fort Calhoun nuclear station. These men and women take pride in their ability to safely operate a clean, dependable source or power. They do so not only as workers, but as residents of the areas they serve. Besides having homes and families, they are valued members of the community, and they often serve as volunteers and social leaders in the community in which we live. They also know that the effective operation of Fort Calhoun Station for another 20 years will contribute to the continued economic benefits to the area. That includes jobs not only for our plant employees, but for many of the area businesses with whom we work.

The point is that we have a stake in continuing to operate the plant in a safe manner and a strong environmental manner.

One other note, OPPD's concern for environment goes beyond Fort Calhoun Station. We have invested in other clean sources of power such as wind and biomass.

In closing, let me thank you for this opportunity to speak on this very important issue in support of the staff's recommendation. Thank you for your time. (FCSD-A-4)

Comment: OPPD provides electricity to more than 300,000 customers in a 13-county area in southeast Nebraska. It must be noted that about 30 percent of the power that's used by our customers on a daily basis is generated by the Fort Calhoun Station. Fort Calhoun is a single-unit plant located between Blair and Fort Calhoun, Nebraska. It was declared commercial in 1973, and has been operating safely ever since. (FCSD-B-2)

Comment: Let me take a few minutes to say something about the employees that work at Fort Calhoun Nuclear Station. These men and woman take pride in being able to safely operate a clean source of dependable power. They do so not only as workers, but as residents of the area we serve. Besides having homes and families in the area, they are valued members of the community, often serving as volunteers and social leaders in the area. They also know that the effective operation of Fort Calhoun Station for another 20 years will contribute economic benefits to that area. That includes jobs for not only plant employees, but for many of the area businesses with whom we work.

The point is that we all have a stake in continuing to operate the plant in a safe and strong commitment to the environment.

One other note, OPPD's concern for the environment goes beyond Fort Calhoun Station. We have invested in other green power sources, such as wind and biomass.

In closing, let me thank you for this opportunity to speak on a very important issue and in support of the staff's recommendation. Thanks for your time. (FCSD-B-4)

Response: *The comments are noted. The comments are supportive of license renewal for Fort Calhoun Station, Unit 1. Public services are evaluated in the GEIS and determined to be a Category 1 issue. Information regarding the impact of socioeconomic issues is discussed in Section 4.0 of this SEIS. The comments provide no new information; therefore, the comments were not evaluated further. There was no change to the SEIS text.*

Comment: Section 2.2.8.5, Page 2-40, Line 11 – There is inconsistency between the population numbers cited for the 50-mile radius (760,514) on this page and that indicated in Table 2-8 (852,711). (FCSD-D-21)

Comment: Section 4.4.1, Page 4-27, Lines 5-7 – It should be clarified that the density values provided in this sentence is for the 50-mile region. Also, there is inconsistency between the population numbers cited for the 50-mile radius (760,514 vs. 852,711 vs. 852,717) in Sections 2.2.8.5 and 4.4.1. (FCSD-D-28)

Comment: Section 4.4.1, Page 4-28, Line 4 – The year 2000 population for the Omaha MSA was stated as 716,998 in OPPD's ER. No population number was given in the ER for the Omaha MSA's 1990 population. Therefore, suggest correcting the sentence to read, "…population was **approximately 716,998 in the year 2000** (OPPD 2002)." (FCSD-D-29)

Response: *The comments were considered and appropriate changes were made to Sections 2.2 and 4.4.*

Comment: Section 2.2.8.6, Page 2-44, Line 15 – Source of information in the table is cited as OPPD's environmental report (ER). The ER does not cite a year 2002 in lieu payment so a new reference is needed. (FCSD-D-22)

Comment: Section 8.1, Page 8-2, Line 22 and Page 8-3, Lines 22-29 – The NRC's conclusions regarding the impacts related to OPPD's payments in lieu of taxes is inconsistent between these two sections and does not follow from the current state requirements for such payments as appropriately described by the NRC on page 8-3, lines 12–20. Irrespective of the existence of FCS, OPPD would remain the retail supplier of electricity in its service territory and, in

accordance with these state requirements, OPPD would continue to pay jurisdictions that now receive these payments, which are computed on the basis of a fixed payment established in 1957 and annual gross revenue from electricity sales. Therefore, termination of FCS operation would have no appreciable effect on these revenues and no associated impact would result. Discussion in Table 8-1 and Page 8-3 lines 22-29 should be revised accordingly. (FCSD-D-32)

Comment: Section 8.2.1.1, Table 8-2, Page 8-9, Line 8 – The following comments relate to Socioeconomics entries on this table:

Operating staff for the coal-fired plant indicated in the comments column for the FCS site alternative should be changed from 15 to 250 per OPPD's estimate in ER Section 7.2.3.1.

It is unclear for both of the site options what is meant by tax and/or wage "impacts" described for the operation-phase in the comments columns. OPPD notes that there would be a decrease in regional economic benefits from net decrease in jobs (from 772 to 250 or 15 for the FCS site or Nebraska City site options, respectively); the Nebraska City site option would result in the greater of these losses to communities near FCS. Any impact from the standpoint of "property taxes" would be small because OPPD's in lieu payments would remain about the same, or could be reduced if net loss of jobs at FCS causes reduced population and thus reduced electric sales in a jurisdiction. OPPD suggests revision to clarify and make the respective assessments consistent with one another. (FCSD-D-39)

Comment: Section 8.2.1.1, Table 8-2, Page 8-11, Lines 1-2 – The loss of 757 jobs at Fort Calhoun Station indicated in the Comment Column for the FCS site option appears to be based on an operating workforce estimate of 15, which is applicable only to the Nebraska City site option, since an operating workforce for a coal-fired plant is already in place there. The estimated operating workforce for the FCS site option is approximately 250. OPPD suggests replacing "loss of about 757 jobs" with "net loss of about 522 jobs". (FCSD-D-40)

Comment: Section 8.2.2.1, Page 8-30, Lines 4-5 – As noted in comment 23, OPPD would continue to be the retail supplier of electricity in its service territory and, under current state rules, would continue its payments in lieu of taxes to the same jurisdictions, regardless of the ultimate source of power (e.g., purchased power, new plant). (FCSD-D-50)

Comment: Section 8.2.3, Table 8-6, Page 8-35, Line 6 – In view of the state's current rules for in lieu tax payments as discussed in previous comments, OPPD suggests replacing "tax base" with "tax and wage impacts from employee earnings" and add "In lieu tax payments would remain unchanged" in the Comments column entry for the FCS option. (FCSD-D-52)

Comment: Section 8.2.3, Page 8-39, Lines 16-18 – In view of the state's current rules for in lieu tax payments as discussed in previous comments, OPPD suggests that this sentence be

replaced with one indicating that OPPD's in lieu tax payments would remain essentially unaffected by FCS operations termination and decommissioning. (FCSD-D-55)

Comment: Section 8.2.6, Page 8-52, Table 8-8, Line 4 – In the Comments column for the FCS site option, suggest replacing "the tax base" with " the tax and wage impacts from employee earnings". Suggest revising the entry for the Cass County site accordingly. OPPD suggests deleting use of the term "tax base" in this context, since that term is normally associated with property taxes. As indicated in previous comments, Nebraska rules require OPPD to make payments to jurisdictions in their service territory in lieu of taxes, primarily based on retail electricity sales (OPPD is the exclusive retail supplier). Therefore, there would be no change in these in lieu payments under this alternative. However, there would be a net loss of jobs in the region (difference between FCS employment and gas-fired plant employment), and associated reduction in economic activity. The text should be revised accordingly. (FCSD-D-59)

Response: *The comments were considered and the text in Sections 2.2, 8.1, and 8.2 have been revised to reflect that in lieu payments would remain unchanged whether or not the FCS operating license is renewed. Other tax-related changes were made as appropriate.*

Comment: Section 2.2.9.2, Page 2-48, Line 31 – The reference citation "McDonald 1926" is not listed in Section 2.3, References. (FCSD-D-26)

Comment: Section 4.4.5, Page 4-32, Lines 19-27 – As written, it is hard to differentiate between the exclusion zone (about 1265 acres) and that portion of the exclusion zone that constitutes the plant site (about 660 acres). OPPD owns the plant site, which lies entirely in Nebraska, and has perpetual easements on the remainder of properties in the exclusion zone, which lie mostly in Iowa (see ER section 2.1.3 and Figure 2.1-3). Suggest revising this paragraph accordingly. In Line 26 delete "in Nebraska" given that the plant site lies entirely in Nebraska and OPPD doesn't own property in Iowa. (FCSD-D-30)

Comment: Section 8.1, Page 8-4, Lines 9-26 – The location of resources of concern (DeSoto Town Site), which occur on the relatively undisturbed uplands between the rail spur and Highway 75, is unclear from the description, partly as a result of confused directions. The following revisions are suggested:

Line 16 – Include a callout to Figure 2-3; replace "western" with "uplands in the southern"
Line 17 – Replace "southern" with "northern".
Line 22 – Replace "northern" with "southern".
Line 23 – Revise the sentence beginning on this line to read as follows (or equivalent): "Disturbance of this area, which lies south of the current railroad right-of-way, could have MODERATE to LARGE impact." (FCSD-D-34)

Comment: Section 8.1, Page 8-2, Lines 24-25 and Page 8-4, Lines 9-26 – The NRC's impact assessment with respect to historic and archeological resources is made in consideration of site land use following decommissioning (line 11). It not clear that future site land use is appropriately within the scope of license renewal except as considered in the context of developing alternative generation facilities on the site, and this aspect appears not to be considered for other impact categories. This approach is further confusing in that the potential impacts related to future land use are attributed to "decommissioning" later in the text (line 20). The NRC recognizes decommissioning and termination of operations as different actions in both the GEIS and its recently issued Supplement 1 to NUREG-0586, and neither of these actions appears to include disposition or use of the plant site following these actions. Suggest revising this paragraph accordingly. (FCSD-D-33)

Response: *Historic and archaeological resources is a Category 2 issue. The comments were considered and appropriate changes were made to Sections 2.2, 4.4, and 8.1.*

Comment: Section 4.4.6, Page 4-34, Line 31 – NRC identifies Colfax county as having minority population; however, this county is not listed as one of the counties falling within the 50-mile radius (see lines 15-17). (FCSD-D-31)

Response: *The comment was considered. Because a portion of Colfax County lies within the 50-mile radius, it was added to the list of counties falling within the 50-mile radius.*

A.1.3 Comments Concerning Threatened or Endangered Species, Aquatic Ecology, or Terrestrial Ecology

Comment: Section 2.1.3.1, Page 2-6, Line 22 – Delete text "and have recently been repeated at Fort Calhoun Station…" (FCSD-D-5)

Response: *Text has been retained, however, a reference to the more recent study has been included in Section 2.1.*

Comment: Section 2.2.3, Page 2-19, Line 26 – This sentence indicates that temperature increase of the cooling water flowing through the main condensers at maximum power is approximately 12 °C. In the license renewal environmental report (Section 3.1.3.2), OPPD states this temperature increase as a nominal temperature rise of 23 °F. This equates to approximately 13 °C rather than 12 °C as stated in the SEIS, and should be changed. For clarification, a temperature increase of 23 °F is applicable to summer conditions when ambient river temperatures are warm; however, OPPD notes that this temperature rise may be several degrees warmer when ambient river water temperatures are cooler because of increased thermal efficiency of the condensers. (FCSD-D-12)

Comment: Section 2.2.3, Page 2-19, Line 31 – This sentence indicates that average change in river temperature would be approximately 1 °C (2 °F) in a turbulent mixing system. However, using lowest monthly average river flow (January) of 20,982 and discharge temperature of 23 °F above ambient, OPPD calculates that the increase in river temperature after complete mixing would be only 0.5 °C (0.9 °F). It is unclear whether this represents a discrepancy; if so, it should be resolved. (FCSD-D-13)

Response: *Staff assumptions on river flow used in the draft SEIS were slightly different from those used by OPPD, leading to differences in rounding; for consistency, the values derived from using OPPD's assumptions have been used in Section 2.2 of the final SEIS.*

Comment: Section 2.2.3, Page 2-19, Lines 31-34 – Revise as follows: "During the winter, the total change in temperature may be greater as the upstream discharge of cooling water is performed to melt any ice in the river to prevent icing of the intake structure. **Under normal winter operating** ~~these~~ conditions, the total change in temperature may be as high as 18°C (32°F) between the intake and discharge of the cooling waters." (FCSD-D-14)

Comment: Section 2.2.5, Page 2-22, Lines 10-12 – Revise sentence to read, "Fish Creek, **a small tributary that outfalls to the Missouri River, on the Fort Calhoun Station site** ~~which is located on Fort Calhoun Station and is the lowermost segment of the Missouri River,~~ provides little available…" (FCSD-D-15)

Comment: Section 2.2.5, Page 2-25, Line 1 – For clarity, revise the sentence to read, "There are six **listed** species that could …" (FCSD-D-16)

Comment: Section 2.2.5, Page 2-25, Lines 26-29 – The location of the Platte River relative to Fort Calhoun Station should be noted. (FCSD-D-17)

Response: *The comments were considered and appropriate revisions were made to the text in Section 2.2.*

Comment: Section 2.2.5, Page 2-25, Line 35-37 – This sentence implies that the amount of suitable habitat for the pallid sturgeon was discussed; however, the previous paragraph does not clearly discuss this point. Recommend enhancing the pallid sturgeon discussion to provide the basis for this sentence. (FCSD-D-18)

Response: *The comment was considered and additional discussion has been included in Section 2.2.*

Comment: Section 2.2.10, Page 2-49, Line 41 – The reference citation "FWS (2001b)" appears to be incorrect. Reference to the 1990 Biological Opinion is made in the more recent FWS Biological Opinion cited as "FWS (2000)". (FCSD-D-27)

Response: *The comment was considered and the referenced FWS citation in Section 2.2 was corrected to read FWS 2000.*

Comment: After reviewing the Assessment, the USFWS concluded that additional information was required before an evaluation could be completed to determine whether the USFWS would be able to concur with a not likely to adversely affect determination for the pallid sturgeon. The USFWS is concerned about the impact of heated water, which is released from the facility, on the pallid sturgeon. In the spring, increasing water temperatures are a spawning cue for the pallid sturgeon. Depending on the degree of increase in water temperature, and the distance downstream it can be detected, operation of the facility may or may not disrupt pallid sturgeon reproduction in the Missouri River. ... (FCSD-E-1)

Response: *The NRC understands the concern of the Department of the Interior (and the U.S. Fish and Wildlife Service [USFWS]) for the minimization of potential impacts to the pallid sturgeon within the Missouri and Platte River systems as reflected in the Department's letter dated April 1, 2003. The NRC's responses to these Department of Interior questions and comments follow.*

Comment: How warm is the released water after it is discharged from FCS? (FCSD-E-2)

Response: *As discussed in the NRC's BA (NRC 2002), the maximum cooling water intake and discharge flow during FCS's normal operations occurs in summer, and amounts to approximately 23 cubic meters per second (m^3/s) (827 cubic feet per second [cfs]), or about 2 percent of the average summer river flow. At the plant's currently authorized maximum power level of 1500 megawatts-thermal (MWt), in effect since 1980, this cooling water is usually discharged at a nominal temperature of approximately 12.8 °C (23 °F) higher than the ambient river temperature in the summer. In the winter, this temperature differential is approximately 17.2–17.8 °C (31–32 °F) when a portion of the heated discharge is recirculated back to the intake structure to prevent icing (OPPD 2002). In the spring and fall when river temperatures are cool, the cooling water discharge may range approximately 0.6–1.7 °C (1–3 °F) higher than the summer nominal temperature differential of 12.8 °C (23 °F), and in winter the temperature differential can range several degrees higher than 17.2–17.8 °C (31–32 °F), reflecting the use of fewer cooling water pumps and higher efficiencies of plant heat exchangers and condensers during those times.*

Several modeling and monitoring studies were conducted by the OPPD, in cooperation with others, from 1973 through 1977 to determine the characteristics of the thermal discharge from FCS (OPPD 1978). These studies were conducted prior to 1980 when the maximum authorized power level and discharge temperature of FCS was lower than present (i.e., 1420 MWt). Results from the 1973 to 1977 studies demonstrated that the Atomic Energy Commission's initial projections for the FCS thermal plume dimensions bounded conditions projected for the current FCS power level (OPPD 2002). The maximum temperature of the FCS discharge authorized under the current NPDES permit for the plant is 43.3 °C (110 °F). However, a temporary authorization of 44.4 °C (112 °F) is allowed in view of unusually high ambient river temperatures that have occurred in recent years.

A cooperative effort was conducted among OPPD, the U.S. Environmental Protection Agency (EPA), and the Nebraska Department of Environmental Quality (NDEQ) to evaluate the characteristics of the thermal discharge from FCS using computer modeling (CORMIX) and field verification (OPPD 2003). The purpose of this effort was to map heat in the Missouri River and to predict compliance with the Nebraska State Water Quality Standards under various river conditions for the purpose of establishing the appropriate national pollution discharge elimination system (NPDES) permit limits. The results from the recent CORMIX study have been used, in addition to past studies at FCS, as the basis for this response. Based on the results of the CORMIX study, the EPA has suggested that the NPDES permit limits for FCS allow the current peak discharges as the permit limit (EPA 2003).

Comment: How far downstream does the released water travel before being fully mixed with the Missouri River water during the May–July time period? Does this distance vary under high and low flow conditions, and if so what is the variation? (FCSD-E-3)

Response: *The downstream distance that FCS cooling water travels before being fully mixed has not been directly assessed in the current CORMIX studies, which have focused on conformance to provisions of Nebraska Title 117 Chapter 1, Section 041, for mixing zones, which is 1524 m (5000 ft) downstream from the discharge point. The CORMIX thermal plume modeling results using near-worst-case summer low-flow conditions indicate that the plume temperature would fall to approximately 1.5 °C (2.7 °F) above river ambient temperature at the end of the mixing zone (OPPD 2003). This modeling run assumed only a circulating water flow from the plant of 22.7 m^3/s (802 cfs), which is slightly lower than total discharge of 23 m^3/s (827 cfs), a discharge temperature of 13.1 °C (23.6 °F) above river ambient temperature, which approximates full power conditions and worst-case summer river conditions, including a summer 7-day, 10-year low-flow (7Q10) of 818 m^3/s (28,892 cfs) and an ambient river temperature of 30.6 °C (87 °F). Historical thermal plume studies indicate that low river flows result in poorer mixing conditions than high river flow conditions, so predicted plume temperature at a point 1524 m (5000 ft) downstream would be lower at higher river flows (OPPD 1978).*

Historical triple-depth field monitoring of the plume in August 1975 provides an example of how rapidly temperatures dissipate in the near field part of the plume during typical summer conditions. At the time those measurements were made, the plant was operating at 96 percent power level, initial discharge temperature was 9.2 °C (16.6 °F) above river ambient temperature, and river flow was 991 m^3/s (35,000 cfs). Results indicated that maximum plume temperatures were 0.95 °C (1.7 °F) and 0.78 °C (1.4 °F) above ambient temperature within 487.6 m (1600 ft) and 1768.8 m (5800 ft) of the discharge point, respectively (OPPD 1978).

Comment: How much does the warm water plume warm the Missouri River in total after mixing? Does the amount of warming vary under high and low flow conditions? (FCSD-E-4)

Response: *Simple dilution calculations can be used to provide theoretical estimates of river temperature increases after total mixing. Assuming a cooling water discharge flow of 23 m^3/s (827 cfs) at an assumed temperature increase of 13.1 °C (23.6 °F), which approximates maximum plant power level in summer, the average river temperature would be increased by approximately 0.4 °C (0.7 °F) under summer low flow conditions (7Q10) of 818 m^3/s (28,892 cfs), and by approximately 0.1 °C (0.2 °F) under a summer maximum monthly average flow (July) of 2,224 m^3/s (78,560 cfs). However, as may be inferred from the response to comment FCSD-E-3 above, full mixing likely occurs within a few miles below the outfall, and heat dissipation factors other than dilution (e.g., heat loss to the atmosphere) are important in reducing plume temperature.*

Comment: During the pallid sturgeon spawning period (May - July), how far downstream (under high and low flow conditions) is a temperature change detectable? Is it detectable at the mouth of the Platte River? (FCSD-E-5)

Response: *As noted in the response to comment FCSD-E-3, the results of the CORMIX study have focused on near-field plume temperatures (e.g., at 1524 m [5000 ft] downstream). However, it is expected that plume excess temperatures would be virtually indistinguishable within a few miles downstream from the outfall. For example, results of triple-depth field monitoring of the thermal plume under conditions cited above in the response to comment FCSD-E-3 indicate that plume excess temperatures were mostly at or below 0.6 °C (1 °F) within approximately 6.4 km (4 mi) below the outfall (OPPD 1978). Diurnal variations in the ambient river may be as high as 1.7 °C (3 °F), based on FCS operations logs. The mouth of the Platte River is approximately 80.5 river kilometers (rkm) (50 river miles [rmi]) downstream from FCS. The FCS thermal plume is undetectable many miles upstream from the mouth of the Platte River. Therefore the staff concludes that because the thermal plume is undetectable many miles upstream of the Platte River, the thermal plume from FCS would not result in inappropriate spawning cues to the pallid sturgeon.*

Comment: Although no pallid sturgeon spawning has been documented in the Missouri River between FCS and Gavins Point Dam, there does appear to be potential spawning habitat between Gavins Point Dam and Ponca State Park. If spawning does occur in this river reach, pallid sturgeon larvae may drift as far downstream as FCS and be susceptible to impingement and entrainment. According to the Assessment, the larval monitoring studies at FCS ended in 1977. (FCSD-E-6)

Response: *The NRC does not believe that reinstatement of larval monitoring studies at FCS is warranted for several reasons, most of which were discussed in the NRC's Biological Assessment (NRC 2002). The following discussion highlights these reasons and provides relevant supporting information.*

1. Rarity of Pallid Sturgeon near FCS

The relative rarity of the pallid sturgeon in the vicinity of FCS and upstream to Gavins Point Dam is indicated by historical collections. No pallid sturgeon were reported to be collected in the extensive monitoring studies conducted by OPPD and others in the FCS vicinity in the 1970s (OPPD 1978; Hesse, Bliss, and Zuerlein 1982). Kallemeyn and Novotney (1977) collected 248 sturgeon as a result of extensive collections in 1976 at one station in the unchannelized reach below Fort Randall Dam Rkm 1416 (rmi 880), two stations in the unchannelized reach below Gavins Point Dam, and one station in the channelized reach below Sioux City, Iowa. Only one pallid sturgeon was found in these collections, in the reach below Fort Randall Dam. All of the remainder were shovelnose sturgeon and, of these, 227 were collected in the unchannelized reach below Gavins Point. No sturgeon were collected in the channelized reach below Sioux City. This finding is consistent with the low catches of shovelnose sturgeon in the OPPD studies for FCS (OPPD 1978).

In the lower Missouri River, within which FCS is situated, more recent documented occurrences of pallid sturgeon are rare. According to the Nebraska Natural Heritage Program (NGPC 2001), between Gavins Point Dam, including its tailwaters, and Nemaha County, approximately at rkm 887 (rmi 525), 32 occurrences of pallid sturgeon were documented from January 1980 through June 2001. FCS is located at rkm 1039 (rmi 646). The number of pallid sturgeon occurring upstream of FCS, according to this data source (NGPC 2001), is 15 out of the 32 occurrences with 17 out of the 32 occurrences downstream of FCS and approximately 7 out of the 32 occurrences documented at the Plattsmouth Bend. This data source (NGPC 2001) also documents an additional 8 pallid sturgeon near the confluence of the Platte and Missouri Rivers, but in the Platte River (from rkm 0.0 to rkm 53 [rmi 0.0 to Rmi 33]), during this same time period. In a separate study funded by the U.S. Army Corps of Engineers (USACE) and carried out by the Nebraska Game and Parks Commission (NGCP) (Mestl 2003), 13 pallid sturgeon were documented in this same reach of the lower Missouri River (i.e., between Rkm 1305 and Rkm 887 [rmi 811 and rmi 525]) during 2001–2002.

The majority of these (i.e., 10 out of the 13 pallid sturgeon) were located near the Plattsmouth Bend (approximately rkm 954–956 [rmi 593–594]).

In summary, the studies done by OPPD in the early 1970s documented no occurrences of pallid sturgeon in the reach of the river near FCS and the Natural Heritage Program has documented only 15 occurrences of pallid sturgeon upstream of FCS to Gavins Point Dam, in the years ranging from January 1980 through June 2001 (NGPC 2001), while NGPC documented none upstream of FCS in their independent study carried out in 2001 and 2002 (Mestl 2003).

2. Low Probability of Spawning Upstream of FCS

The rarity of juvenile and adult pallid sturgeon in the Missouri River from Gavins Point to St. Louis is indicated by recent collections that have included the lower Missouri River, in which the species has comprised only 0.2 to 0.4 percent of total river sturgeon collected (FWS 2000). Both the rarity of the species in the river and in the FCS site vicinity and upstream to Gavins Point indicates that there is a low potential production of larvae upstream from FCS. As noted above, there have been relatively more observations of this species on the Missouri River near the mouth of the Platte River, approximately 80.5 kilometers (50 miles) downstream from FCS.

The low potential for significant numbers of pallid sturgeon larvae to occur in the drift at FCS is supported by the low incidence of Scaphirhynchus *sp. larvae found in intensive Missouri River fish larvae collections by OPPD and others in the vicinity of FCS in the 1970s. A review of available summary reports for that period indicate that the number of Scaphirhynchus sp. larvae collected in these efforts included none in 1974 and 1975, 1 in 1976, and one to a few in 1977 (OPPD 1978; OPPD 1977). Harrow and Schlesinger (1980) collected only 23 Scaphirhynchus sp. larvae (of a total 44,110 total larvae) in intensive vertical composite plankton net sampling at seven cross-channel transects on the Missouri River between Gavin's Point Dam and Leavenworth, Kansas. Fewer than 10 of these larvae were collected at the transect located at FCS. It is highly likely that all of these larvae were shovelnose sturgeon, which were and remain much more common than the pallid sturgeon in the Missouri River, as discussed above.*

During the 1970s, documented occurrences of adult pallid sturgeon in the Missouri River per year were reduced by approximately 58% as compared to a more drastic reduction in the 1980s of 86% (55 FR 26641 [FWS 1990]). Despite the relative greater abundance of pallid sturgeon during the OPPD study period, and the subsequent higher potential for spawning to successfully occur, only a few Scaphirhynchus sp. larvae were found. It was not possible to identify the collected larvae below the genus Scaphirhynchus. Additionally, despite recent pallid sturgeon recovery efforts, evidence of successful reproduction and recruitment throughout its range remain rare. Only three pallid sturgeon larvae have been found in the lower Missouri River. Their relative number to other species of collected larvae suggests that spawning

success and larval abundance for the pallid sturgeon remain low (FWS 2000). Given that pallid sturgeon occurrences upstream remain rare, despite recent habitat restoration and population augmentation efforts, and that evidence of successful spawning and larval abundance also remains very low, the NRC staff concludes that a far field larval monitoring program around FCS would not generate any useful data.

The upstream Gavins Point–Ponca reach of the Missouri River may have some potential to support spawning of the pallid sturgeon, because this unchannelized reach exhibits more natural habitat characteristics than does the river downstream, which is channelized (as at FCS). However, spawning substrate is reportedly quite limited, based on observations of Hesse and Mestl (1993) with respect to the paddlefish (Polyodon spathula), which spawns demersal adhesive eggs on coarse substrates in swift current, as is presumed to be the case for the pallid sturgeon (Smith 1979, FWS 2000). In addition, as indicated by FWS in their January 13, 2003, letter (FWS 2003), no pallid sturgeon spawning has been documented in the Missouri River between FCS and Gavins Point Dam, and the specific suitability of the Gavins Point–Ponca reach for pallid sturgeon spawning has not been demonstrated.

Further, it is recognized that the hydrologic regime established under the current water control plan (CWCP) of the USACE, particularly suppression of spring flows, has likely resulted in the loss of spawning cues (i.e., warm water coupled with river stage increases) for the pallid sturgeon (FWS 2000), which would act to reduce or eliminate spawning success even if otherwise suitable spawning habitat is present. The proposed increase of river flows during spring, to produce an artificial spring rise and the potential restoration of a spawning cue for the pallid sturgeon, is one of the most contentious issues surrounding the revision of the Missouri River Master Manual. This involves recommended additional spring flows of 425 to 566 m^3/s (15,000 to 20,000 cfs) through Gavins Point Dam during the month of May. It is unclear at this time whether such a plan will be implemented (MDNR 2003). While the critical importance of this habitat component is recognized, the magnitude, frequency, and duration of these spawning cues for the pallid sturgeon currently remain unknown, and the USACE has indicated the need for additional research, monitoring, and evaluation to determine appropriate temperature and hydrologic parameters (USACE 2003).

In summary, the staff concludes that despite an intensive monitoring program in the 1970s, when the adult population was significantly more abundant, the number of Scaphirhynchus sp. larvae caught were not sufficient to make any meaningful, and statistically valid, conclusions about the impact of the facility on the pallid sturgeon. Additional site-specific studies at this time would likely yield even less useful data.

3. Additional larval monitoring studies at FCS are unnecessary

The NRC believes that further monitoring studies at FCS would not be useful in demonstrating whether FCS has any adverse effect on the pallid sturgeon. Monitoring studies of fish impingement and entrainment at FCS and fish populations in the Missouri River, tributary streams, and backwater habitats on and near the FCS site in the 1970s did not specifically document the presence of pallid sturgeon, and no detectable effect on Missouri River fish populations from FCS operation was discerned on the basis of these intensive studies. As noted in the Pallid Sturgeon Recovery Plan (FWS 1993) and broadly stated elsewhere, destruction and alteration of habitats by human modification of the river system are the primary cause of declines in reproduction, growth, and survival of a pallid sturgeon, and it is unlikely that the species can be recovered without restoring these habitat elements, which include morphology, hydrology, temperature regime, cover, and sediment/organic matter transport.

The NRC staff has determined, based on the known distribution of the pallid sturgeon in the Missouri River, the volume of water withdrawn by the station, the extent of the thermal plume, life history information on the pallid sturgeon and related species, and the questionable value of additional larval sturgeon collection studies in the channelized portion of the Missouri River, that there is no need to conduct additional larval monitoring studies at this time. While the NRC recognizes the critical importance of protecting the pallid sturgeon from possible extinction, the NRC concludes that implementing such a monitoring study is not needed nor helpful in achieving this goal and is also not needed to assess the impact of FCS's continued operations on the pallid sturgeon and protecting this endangered species. Previous OPPD studies remain relevant and supportive of NRC's conclusion that continued operations of FCS may affect, but is not likely to adversely affect the pallid sturgeon. The comments were considered and appropriate changes have been made to Section 4.6.

Comment: Given the 10-year lead time for this action to be implemented and the absence of a discussion of past, present or reasonably expected future actions (including non-federal) that could reduce the assimilative capacity (heat) of the Missouri River, EPA rates the DEIS "EC-2" (Environmental Concerns-Insufficient Information). To address information deficiencies, EPA recommends that the Nuclear Regulatory Commission (NRC) discuss (in the Final EIS) the cumulative effects of current and projected heat contributors to the Missouri River within Fort Calhoun's geographic scope of impact/influence, or provide details of control strategies that OPPD could undertake under increasing discharge limitation scenarios. For the purpose of assisting the NRC with this analysis, EPA has enclosed a thermal discharge technical report and modeling data. (FCSD-F-1)

Response: *Although the NRC is considering an application for renewal of the operating license for the Fort Calhoun Station, Unit 1, for an additional 20 years beyond the original license expiration date of 2013 (i.e., to 2033), it is scheduled to issue the Final Supplemental*

Environmental Impact Statement (SEIS) in August 2003, and will make its license renewal decision in November 2003. The renewed license, if issued, will supersede the original license and will be valid from date of issuance in November 2003 until November 2033. The staff believes that confusion over this schedule may have lead the EPA to inadvertently conclude that a 10-year lead time existed for the implementation of additional studies and for finalizing the license renewal decision-making process. Also, the NRC considered the additional data provided by the EPA on thermal discharges and modeling and expanded Section 4.1 appropriately.

Comment: The document does not mention whether power demands on the Fort Calhoun facility are expected to change significantly from present levels during the license renewal period (up to 20 years). If consumer power needs in the service area increase significantly, please clarify how this would affect operations, expansions/upgrades, effluent release, and waste quantity. The anticipated growth rate of the service area during the renewal period should be taken into consideration. (FCSD-F-2)

Response: *Power demands are expected to increase with population and growth of industry over the license renewal period, and this may cause the OPPD, the licensee for FCS, to request an amendment to increase in the authorized power level for the plant. Currently, OPPD plans to submit an amendment request to the NRC for a less than two percent power uprate by the end of July 2003.*

The recent (September 2001) thermal modeling studies performed by EPA, the United States Geological Survey (USGS), and the Oregon Graduate Institute, indicate that as temperatures in the Missouri River upstream of FCS rise to 31 ^{o}C (88 ^{o}F), the 32 ^{o}C (90 ^{o}F) limit of the Nebraska Surface Water Quality Standards (Title 117 Chapter 4.003.01B) at the end of the mixing zone may be exceeded. The less than two percent power increase that OPPD plans to submit in July 2003, could have a minor impact on these results, however, it is unlikely because the maximum discharge temperatures from FCS will continue to be limited by the national pollution discharge elimination system (NPDES) permit to 43.3 ^{o}C (110 ^{o}F) (Permit # NE0000418 or 44.4 ^{o}C [112 ^{o}F] with the current Consent Order, Case #2206). At this time, the NRC is unaware of any other power uprates for FCS beyond the planned July 2003 request. All power uprates would require a separate review process. In addition, a change in production leading to increased temperatures in the cooling water discharge would have to be approved by the State of Nebraska under the NPDES permitting process. The comment was considered and consideration of potential cumulative impact of growth in demand on discharge temperatures has been added to Section 4.1.

Comment: Page 2-38, Lines 22-23: The DEIS states that "there are currently no growth-control measures in place to restrict development." Does this fact have utility for the decision-maker in the re-licensing process? If so, how would growth around the plant affect licensing considerations? (FCSD-F-4)

Response: *A majority of the scenarios considered during the review assume that the plant is operating at full capacity. Therefore, there is a limit to the necessity to consider population growth and its effect on total production capacity of the plant. Increased power demands beyond full power would require additional changes to the plant or construction of a new one, both of which would require a separate environmental review. The comment was considered and additional discussion has been added to Section 4.1.*

Comment: Page 2-49, Lines 18-21: The DEIS limits discussion of cumulative impacts to only the U.S. Army Corps of Engineers' revisions of the *Missouri River Main Stem Reservoir System Master Manual* (1979). The CEQ regulations on NEPA are specific on the need for cumulative impacts analysis (Sec. 1502.16 Environmental consequences, Sec. 1508.7 Cumulative effects and Sec. 508.8 Effects). The EPA recommends that the NRC evaluate all potential actions (increasing universe of thermal dischargers and planned OPPD expansions) and causes (drought, climate change) which may reduce available Missouri River cooling capacity over the renewed OL period. In making this evaluation, NRC should also keep abreast of potential Missouri River Master Manual (flow regime) revisions and, also, any water quality standards revisions that may be made by the State of Nebraska. (FCSD-F-5)

Response: *Many sources of information were considered during this license renewal consideration process. On the issue of cumulative impacts on the Missouri River, the major issue relating to plant operation is the thermal impact of cooling system discharges. In reviewing the scientific literature on thermal regimes in the Missouri River, a recent study performed by scientists from the University of Iowa was identified. The study utilized available temperature data and a dynamic river flow and mixing model (CHARIMA) to examine the thermal regime in the Missouri from Gavins Point Dam down to Rulo, Nebraska (near the Kansas border). There are at least 5 power plants along this reach which discharge into the river, two of which (Omaha Units and Council Bluffs) lie between FCS and the confluence of the Platte and Missouri Rivers. This investigation established that, relative to other discharges to the Missouri, the total impact of FCS discharge on the thermal regime of the Missouri is minor (Wright, et al., 1999). This study examined a number of different scenarios beyond those that could result from proposals in the Missouri River Main Stem Reservoir System Master Manual, projecting the thermal regime 40 years into the future. The most extreme simulation assumed all the power plants on the reach were operating at maximum capacity, a summer low flow regime, and an increase in ambient temperature due to global warming. Even under these most extreme conditions, while a cumulative warming affect was demonstrated, water*

temperatures did not exceed the 32 °C (90 °F) maximum limit. Also under those extreme conditions, river temperature for the month of August (an indicative summer month) were on average less than 26 °C (79 °F). It is the conclusion of the NRC staff that these conservative analyses provide evidence that the cumulative impacts of the operation of Fort Calhoun Station, Unit 1 through August 2033 on the thermal regime of the Missouri River will be SMALL. The comment was considered and Section 4.1 was expanded appropriately.

A.1.4 Comments Concerning Human Health

Comment: Executive Summary, Page xvii, Lines 22-24 – This sentence incorrectly indicates that the OPPD application addressed chronic effects from electromagnetic fields. Consistent with Table B-1 of 10 CFR Part 51, subpart A, Appendix B, OPPD did not address this "NA" issue in the Environmental Report (ER) submitted with the license renewal application. This sentence should be revised accordingly. (FCSD-D-1)

Comment: Section 9.1, Page 9-4, Lines 30-32 – NRC incorrectly indicates that OPPD's license renewal application presents an analysis of chronic effects from electromagnetic fields. Mention of this "n/a" issue should be deleted from the sentence. (FCSD-D-60)

Response: *The comments were considered and appropriate changes were made to the Executive Summary and Section 9.1.*

Comment: Section 2.2.7, Page 2-33, Lines 27-34 – OPPD has submitted corrections to data provided in the 2001 annual report (letter from OPPD (R. T. Ridenoure) to NRC (Document Control Desk) dated April 4, 2003 (LIC-03-0039)). As a result, the following changes should be made:

The air dose due to noble gases in gaseous effluents was 3.**2**4 x 10^{-3} mSv (3.**2**4 x 10^{-1} mrad) gamma (3.**2**4 percent of the 0.10-mGy [10-mrad] gamma dose limit) and 1.**19** x 10^{-2} mGy (1.**19** mrad) beta (**5.95** percent of the 0.20-mGy [20-mrad] beta dose limit).

The critical organ dose from gaseous effluents due to iodine-131, tritium, and particulates with half-lives greater than eight days was **4.83** x 10^{-2} mSv (**4.83** mrem), which is **24.15** percent of the 0.15-mSv (20-mrem) dose limit.

Note: The corrected data above for 2001 was submitted along with the 2002 Annual Radiological Effluent Release Report. The NRC may want to use the 2002 data. Whichever data is used, the reference citation should be changed accordingly. (FCSD-D-19)

Response: *The correct data changes were minor and did not change any staff conclusions. All data changes in the comment were made with the exception of using 20 mrem as the*

conversion for 0.15 mSv and the 24.15 percent. The correct conversion is 15 mrem and the correct percentage is 32.2 percent. The comment resulted in changes to Section 2.2.

A.1.5 Comments Concerning Alternatives to License Renewal

Comment: Section 8.2, Page 8-6, Lines 24-30 – This paragraph appears to be misplaced, and seems more appropriately inserted after line 14 on page 8-7. In addition, in view of the NRC's assumption of consistency with OPPD's LRA ER, the plant size should be changed from 508-MW to 500-MW. (FCSD-D-35)

Comment: Section 8.2, Page 8-6, Footnote b – This footnote refers only to the coal-fired alternative, so the first sentence should be deleted. Also, in view of the NRC's assumption of consistency with OPPD's LRA ER, the plant sizes should be changed to approximately 500 gross MW and 475 net MW. (FCSD-D-36)

Comment: Section 8.2.1, Page 8-7, Lines 19-20 – The amount of ash cited in this sentence (74,000 tons) is incorrectly indicated as the total amount of ash that would be collected and disposed on the site. However, 74,000 tons represents only the amount of ash OPPD estimates would require disposal; OPPD assumes that the balance of the ash would be recycled (LRA ER, Section 7.2.3.1). The sentence should be revised accordingly. (FCSD-D-37)

Comment: Section 8.2.1.1, Table 8-2, Page 8-8, Line 7 – OPPD assumes that the NRC reduced site acreage estimates provided by OPPD in its ER for a plant using a closed-cycle cooling system by 25-30 acres (average of 27 acres) as noted in the DSEIS, Table 8-3. Unlike the acreage estimates for land use, the estimate of 340 acres cited here for the Ecology impact category are not consistent with this assumption. It appears that acreage should be changed to 127 ha (313 ac). (FCSD-D-38)

Comment: Section 8.2.1.1, Page 8-11, Lines 10-12 – The NRC indicates on Page 8-6, lines 25-27 that, unless otherwise indicated, assumptions and numerical values used in Section 8.2.1 are from OPPD's ER. However, OPPD did not estimate acreages needed for a once-through cooling option as stated in this section. It is suggested that the beginning of this sentence be reworded to "Based on OPPD's estimates for a closed-cycle cooling system, the NRC estimates that ... ". Also, for consistency with Table 8-2 entries, it would seem appropriate to change "10 ha (25 ac)" to "10-12 ha (25-30 ac)" on line 12. (FCSD-D-41)

Comment: Section 8.2.1.1, Page 8-11, Line 17 – Text on this line should be revised to clarify that "30-m-wide (100-ft-wide)" refers to assumed transmission right-of-way width. (FCSD-D-42)

Comment: Section 8.2.1.1, Page 8-12, Line 28 – For consistency with previously stated estimates for land use requirements in Table 8-2, it appears that "60 ha (140 ac)" should be changed to "46 ha (114 ac)". (FCSD-D-43)

Comment: Section 8.2.1.1, Page 8-13, Line 10 – OPPD assumes that the NRC reduced site acreage estimates provided by OPPD in its ER for a plant using a closed-cycle cooling system by 25-30 acres (average of 27 acres) as noted in the DSEIS, Table 8-3. Unlike the acreage estimates for land use, the estimate of 340 acres cited here for the Ecology impact category are not consistent with this assumption. It appears that acreage should be changed to "127 ha (313 ac)" if referring to the total acreage needed for the site. However, if the intention is to only discuss that portion of the acreage needed for developing coal and limestone delivery, storage, and handling facilities the appropriate acreage amount would be 200 acres. This discussion should be revised accordingly. (FCSD-D-44)

Comment: Section 8.2.1.1, Page 8-13, Line 38 – It appears that the first sentence on this line should be deleted because this section is intended to address impacts of the once-through cooling option. (FCSD-D-45)

Comment: Section 8.2.1.1, Table 8-3, Page 8-21, Lines 18-19 – As indicated on Line 4 of this page, no cooling ponds would be used for this alternative. Therefore, it appears that this entry for Groundwater Use and Quality should be "No change". (FCSD-D-46)

Comment: Section 8.2.2, Page 8-22, Lines 3-4 – For clarity, OPPD suggests that the first sentence be revised to indicate that this section addresses impacts for a gas-fired plant considering two site options: the Fort Calhoun site and the Cass County site. (FCSD-D-47)

Comment: Section 8.2.2, Page 8-22, Line 11 – It appears that the sentence indicating that "infrastructure changes would be SMALL to MEDIUM" is inadvertent and should be deleted, since this section is merely describing the facility, not associated impacts. (FCSD-D-48)

Comment: Section 8.2.2.1, Page 8-23, Table 8-4, Line 7 – Since both the Fort Calhoun site and Cass County site have most onsite infrastructure required for the plant, OPPD suggests that the acreage requirements for the FCS site alternative be change to correspond to the requirement listed for the Cass County site; i.e., "10 ha (25 ac)". Also, since both sites have offices, parking, and most roads required, it would be appropriate to replace this text with "and related facilities", which may include onsite area needed for transmission and pipeline hookups, power block access road, etc. (FCSD-D-49)

Comment: Section 8.2.2.2, Table 8-5, Page 8-32, Lines 6, 7, and 8 – Cooling ponds are not included in the representative plant alternative design as described in the introductory text on page 8-31. Therefore, OPPD suggests replacing "development of a cooling pond" with "use of a cooling tower" on line 6, deleting "and ponds" on line 7, and replacing entry in line 8 with "No change". (FCSD-D-51)

Comment: Section 8.2.2 – Note that in the OPPD ER, OPPD specifically limited the natural-gas-fired alternative at the Cass County site to closed-cycle cooling. Use of once-through cooling at this site is rendered impractical due to the limited availability of cooling water and limited ability of Four Mile Creek to handle associated discharge. NRC should reconsider the viability of a once-through system at this location. (FCSD-D-53)

Comment: Section 8.2.3, Page 8-36, Line 9 – FCS does not have a cooling canal system. For accuracy, OPPD suggests deleting the word "canal" on this line. (FCSD-D-54)

Comment: Section 8.2.3, Table 8-7, Page 8-41, Lines 15, 16 – The bases for impact assessment in this table are inconsistent with the coal and gas alternatives in that cooling towers were assumed to be used for the closed-cycle cooling system (see pages 8-21 and 8-31) and this table address the use of cooling towers only in all areas except Groundwater Use and Quality. Suggest deleting mention of ponds on line 15 and replacing entry in line 16 with "No change". (FCSD-D-56)

Comment: Section 8.2.5.4, Page 8-45, Lines 3-5 – For clarification, the 167-MW of hydroelectric generating capability mentioned here and in OPPD's ER (Table 7.2-3) denotes developed capability in the year 1998, not potential undeveloped capability. Therefore, the NRC may wish to revise or delete this text. (FCSD-D-57)

Comment: Section 8.2.6, Page 8-51, Table 8-8, Line 7 – The NRC notes that the impact assumptions in this section for the gas-fired generation contribution are the same as those made in Section 8.2.2, adjusted for reduced generating capacity. As noted previously, since both the Fort Calhoun site and Cass County site have most onsite infrastructure required for the plant, OPPD suggests that the acreage requirements for the FCS site alternative be change to correspond to the requirement listed for the Cass County site; i.e., "10 ha (25 ac)". Also, since both sites have offices, parking, and most roads required, it would be appropriate to replace this text with "and related facilities", which may include area needed for onsite transmission and pipeline hookups, power block access road, etc. (FCSD-D-58)

Response: *The comments were considered and appropriate changes were made to Section 8.2.*

A.1.6 Editorial Comments

Comment: Table 1-1, Page 1-9, Line 7 – Suggest adding a note to the "Permit Expiration or Consultation Date" column to indicate that the NPDES permit provides for ongoing water quality certification. (FCSD-D-2)

Comment: Figure 2-2, Page 2-3 – The Note included within the figure should be removed or revised to refer the reader to Section 2.1.7. It appears this was taken directly from the OPPD ER. (FCSD-D-3)

Comment: Section 2.1.3, Page 2-6, Lines 12 and 13 – This sentence indicates that the potable water supply is discussed in the subsections of this section. However, the municipal water supply and potable water use is discussed in Section 2.2.2. Therefore, the sentence should be revised to read, "Details of the once-through cooling system and groundwater withdrawals are discussed in the following sections." (FCSD-D-4)

Comment: Section 2.1.4.1, Page 2-9, Lines 39-40 and Page 2-10, Lines 1-8 – Revise text as follows, "…tanks located in the containment building~~,~~ **and** auxiliary building**.** ~~, and chemical and radiation protection (CARP) facility, respectively (OPPD 1999). Auxiliary and reactor wastes are then transferred to liquid waste collection tanks in the radioactive waste-processing building (RWPB; OPPD 2001b). In this building~~ **In the Radioactive Waste Processing Building**, liquid wastes can then be processed through a charcoal filter and a demineralizer system, which remove most radioactive materials and dissolved solids. Hotel wastes can also be processed through the filters and demineralizer if necessary. The processed liquid waste is collected in one of two liquid-waste monitoring tanks and is sampled before being released to the overboard header. The overboard header is the only path through which liquid radioactive waste from the **plant** ~~containment building, auxiliary building, CARP facility, and the RWPB~~ can be released to the environment. (FCSD-D-6)

Comment: Section 2.1.4.1, Page 2-10, Line 15 – Correct this sentence to read, "…discharged directly to the ~~condenser~~ **Raw Water System and then to the** circulating-water-discharge tunnel. (FCSD-D-7)

Comment: Section 2.1.5, Page 2-13, Line 2 – Directional qualifiers used in this sentence are contradictory. Delete "on the northeast portion of the facility." (FCSD-D-8)

Comment: Section 2.2.2, Page 2-18, Line 8 – The rate of water use should be indicated; therefore, revise the sentence to read, "…approximately 38 million L (10 million gal) **per month** of filtered, …" (FCSD-D-10)

Comment: Section 2.2.2, Page 2-18, Line 15 – Delete "ionics". (FCSD-D-11)

Comment: Section 2.2.8.2, Page 2-37, Line 24 – As indicated Highway 75 is a US highway not an interstate. Therefore, the parenthetical, "(I-75)", should be deleted. (FCSD-D-20)

Comment: Section 2.2.9.1, Page 2-45, Line 19 – Correct "east" to "west". (FCSD-D-23)

Comment: Section 2.2.9.1, Page 2-45, Line 29 and 36 – In Line 29 reference "Radin 1923" is not listed in the Section 2.3, References. In Line 36 the "Iowa" should be corrected to "Ioway." (FCSD-D-24)

Comment: Section 2.2.9.2, Page 2-47, Line 21 – For clarity, indicate that U.S. Highway 73 is now known as U.S. Highway 75. (FCSD-D-25)

Response: *The comments were considered and appropriate changes were made to Sections 1.1, 2.1, and 2.2.*

Comment: Section 2.1.5, Page 2-13, Line 18 – Insert "presently" between "are" and "taken". (FCSD-D-9)

Response: *The comment was considered, but no change was made. The text is written in the present tense and properly reflects current operations.*

A.1.7 Other Comments

Comment: Since the current operating license for FCS does not expire until 2013, the USFWS requested that the larval monitoring studies be reinitiated to verify that pallid sturgeon larvae are not being adversely affected by FCS operations. (FCSD-E-7)

Comment: Page 1-1, Lines 21-23: The Draft Environmental Impact Statement (DEIS) states that "This OL will expire in August 2013. On January 9, 2002, the OPPD submitted an application to the NRC to renew the Fort Calhoun Station Unit 1 for an additional 20 years under 10 CFR Part 54." The EPA notes that application for renewal is submitted 11 years in advance of current Operating License (OL) expiration (2013). Given this time period, EPA believes that Nuclear Regulatory Commission (NRC) should be cognizant of the expectations of the Council on Environmental Quality (CEQ) with respect to information currency. Per the 1981 memorandum entitled "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," "...if the proposal has not yet been implemented, or if the EIS concerns an ongoing program, EISs that are more than 5 years old should be carefully reexamined to determine if the criteria in Section 1502.9 compel preparation of an EIS supplement. If an agency has made a substantial change in a proposed action that is relevant to environmental

concerns, or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts, a supplemental EIS must be prepared for an old EIS so that the agency has the best possible information to make any necessary substantive changes in its decisions regarding the proposal. Section 1502.9(c)." (FCSD-F-3)

Response: *Although the NRC is considering an application for renewal of the operating license for the Fort Calhoun Station, Unit 1 for an additional 20 years beyond the original license expiration date of 2013 (i.e., to 2033), it is scheduled to issue the Final Supplemental Environmental Impact Statement (SEIS) on the proposed FCS Unit 1 license renewal application in August, 2003, and will make its license renewal decision by November 2003. The renewed license, if issued, will supersede the original license and will be valid from date of issuance in November of 2003 until 2033. The NRC believes that the confusion over this schedule may have lead to an inadvertent conclusion that there was still a 10-year time period before finalizing the license renewal environmental review and decision-making process. The comment was considered and appropriate changes were made to Sections 1.3 and 9.0.*

A.2 Public Meeting Transcript Excerpts and Comment Letters

Transcript of the Afternoon Public Meeting on February 26, 2003, in Omaha, Nebraska

[Introduction, Mr. Cameron]
[Presentation by Mr. Tappert]
[Presentation by Mr. Burton]
[Presentations by Mr. Cushing]
[Presentation by Dr. Zahn]

MR. CAMERON: Time to hear from anybody who wants to make a public comment. We only have one person signed up formally now. If anybody else wants to make a public comment, please feel free to do so. And we have Gary Gates, who is the vice president for nuclear programs, I believe, at Omaha Public Power District. Gary.

MR. GATES: As stated, my name is Gary Gates. I'm vice president that is responsible for the operation of Fort Calhoun Station. I'd also like to acknowledge many of the OPPD staff that are here today that have worked hard with the NRC on providing information on our application. And a special acknowledgment to Director Anne McGuire who is a member of our board of directors and in particular is in charge of the, and chair of the Nuclear Oversight Committee of our board which monitors our performance.

I spoke to you in June, at the June meeting in Omaha concerning our license renewal application, I welcome the opportunity to do so again today in support of the preliminary

conclusions of the NRC staff that there are no environmental impacts to preclude renewal of the operating license for Fort Calhoun Station. (FCSD-A-1)

OPPD provides electricity to more than 300,000 customers in a 13-county area in southeast Nebraska. It must be noted that 30 percent of this generation for those customers is generated at the Fort Calhoun Station. Fort Calhoun's a single unit plant located between Blair and Fort Calhoun and was declared operational and commercial in 1973, and has been operating safely since then. I am proud to have been a part of that operation of Fort Calhoun since the initial construction. (FCSD-A-2)

We feel that over the last 30 years we have demonstrated a high level of safety and environmental stewardship with all of our programs and operations. In fact, the continued safe operation of Fort Calhoun Station remains the number one priority at OPPD. OPPD maintains its facilities and conducts its operation based on a strong commitment to environmental monitoring and management. Our policy is to conduct operations, not just in compliance with all applicable government laws and regulations, but over and beyond minimum requirements for those regulations. This ensures our ability to protect the environment and to serve in the best interest of our employees, our customers, and surrounding community.

We feel the NRC staff recommendation, which the subject of today's meetings, is a testament to the effectiveness of that approach. OPPD will continue what we believe is a comprehensive environmental monitoring program, hopefully for an additional 20 years of operation from 2013.

Furthermore, we will continue to develop and implement ways to further minimize the risks associated with operation of a nuclear plant. In other words, we are committed to conducting our operations in an environmentally responsible manner as we have done for the last 30 years. (FCSD-A-3)

Let me take a few minutes to say something about the employees who work at Fort Calhoun nuclear station. These men and women take pride in their ability to safely operate a clean, dependable source or power. They do so not only as workers, but as residents of the areas they serve. Besides having homes and families, they are valued members of the community, and they often serve as volunteers and social leaders in the community in which we live. They also know that the effective operation of Fort Calhoun Station for another 20 years will contribute to the continued economic benefits to the area. That includes jobs not only for our plant employees, but for many of the area businesses with whom we work. The point is that we have a stake in continuing to operate the plant in a safe manner and a strong environmental manner.

One other note, OPPD's concern for environment goes beyond Fort Calhoun Station. We have invested in other clean sources of power such as wind and biomass.

In closing, let me thank you for this opportunity to speak on this very important issue in support of the staff's recommendation. Thank you for your time. (FCSD-A-4)

MR. CAMERON: Thank you. Thank you, Gary.

Is there anybody else who wants to make a statement, provide a comment at this point or ask a question? Okay. I think we probably could adjourn at this point, and we're going to be back at seven o'clock for another public meeting and an open house at six o'clock before that meeting. And thank all of you for attending.

Transcript of the Evening Public Meeting on February 26, 2003, in Omaha, Nebraska

[Introduction, Mr. Cameron]
[Presentation by Mr. Tappert]
[Presentation by Mr. Burton]
[Presentations by Mr. Cushing]
[Presentation by Dr. Zahn]

And let's go to the formal comment part of the meeting. And first of all, we're going to hear from -- from the Omaha Public Power District. We have Gary Gates with us who is the vice president for Nuclear Operations there. Gary.

MR. GATES: Thank you. My name's Gary Gates. I'm the vice president of OPPD that's responsible for the operation of Fort Calhoun Station. I'd like to acknowledge at this time any of the OPPD staff that's here tonight. They've put in a lot of work and a lot of effort to get to this point in the license renewal process. They definitely have the appreciation of the district, as well as myself. I'd like to also acknowledge two individuals that are here: Mr. Chuck Elderd, who's the chief financial officer at OPPD, who's, here representing the City Management Team, as well as myself. And Director, Anne McGuire is here. She's part of the OPPD board, and currently serves as the chair of the Nuclear Oversight Committee.

I spoke at your June meeting in Omaha concerning the license renewal application, and I welcome the opportunity to speak this evening in support of the conclusion reached by the NRC, but there are no environmental impacts that preclude the renewal of the operating devices of the Fort Calhoun nuclear plant. (FCSD-B-1)

OPPD provides electricity to more than 300,000 customers in a 13-county area in southeast Nebraska. It must be noted that about 30 percent of the power that's used by our customers on a daily basis is generated by the Fort Calhoun Station. Fort Calhoun is a single-unit plant located between Blair and Fort Calhoun, Nebraska. It was declared commercial in 1973, and has been operating safely ever since. I am proud to have been a part of Fort Calhoun since the initial construction. We feel that over the last 30 years we have demonstrated a high level of safety and environmental stewardship in all our programs and operations. (FCSD-B-2)

In fact, the continued safety operation of Fort Calhoun Station remains the number one priority of OPPD. OPPD maintains its facilities and conducts its operations based on a strong commitment to the environment and monitoring and the management of those policies. Our policy is to conduct operations, not just in compliance with all applicable government laws and regulations, but over and beyond minimum requirements of those regulations. This ensures our ability to protect the environment and to serve in the best interest of our employees, our customers and the surrounding communities. We feel the NRC staff recommendation, which is the subject of today's meeting, is a testament to the effectiveness of our approach.

OPPD will continue, what we believe, is a comprehensive, environmental monitoring program, hopefully for an additional 20 years, beyond 2013. Furthermore, we will continue to develop and implement ways to enhance the operation of Fort Calhoun Station. In other words, we are committed to conducting our operations in an environmentally responsible manner as we have done in the last 30 years. (FCSD-B-3)

Let me take a few minutes to say something about the employees that work at Fort Calhoun Nuclear Station. These men and woman take pride in being able to safely operate a clean source of dependable power. They do so not only as workers, but as residents of the area we serve. Besides having homes and families in the area, they are valued members of the community, often serving as volunteers and social leaders in the area. They also know that the effective operation of Fort Calhoun Station for another 20 years will contribute economic benefits to that area. That includes jobs for not only plant employees, but for many of the area businesses with whom we work.

The point is that we all have a stake in continuing to operate the plant in a safe and strong commitment to the environment. One other note, OPPD's concern for the environment goes beyond Fort Calhoun Station. We have invested in other green power sources, such as wind and biomass. In closing, let me thank you for this opportunity to speak on a very important issue and in support of the staff's recommendation. Thanks for your time. (FCSD-B-4)

MR. CAMERON: Okay. Thank you very much, Gary.

Our next speaker is Mr. Rob Hall. And Mr. Hall is with the Omaha, Nebraska, and Southwest Iowa Building Trades. Do you want to come up here or -- wherever you feel comfortable.

MR. HALL: I'm fine right here.

MR. CAMERON: Okay. Good. Go ahead.

MR. HALL: My name is Rob Hall, and I represent the Omaha -- Greater Omaha, Nebraska, and Southwest Iowa Building and Trade. We're the construction unions that support the inside construction/maintenance at Fort Calhoun facility. My tenure in the industry goes back 28 years. I worked 18 months for OPPD, most of that time was at Fort Calhoun. And when I think back — of course I was a little bit younger then — but I realized now that was probably one of the premiere atmospheres that I've ever worked in.

Today we are working hand in hand with OPPD to come up with some new innovative ways to — for labor to help them and for them to help labor in the community. It's a great tribute to the leadership and management at this facility. And that goes from the managers to the planners to the training department. It's unbelievable the ground we've covered and the issues we discussed.

One of them, of course, is safety. And we're working on several issues there. I can speak from my trade union, which is the Asbestos Workers and the Piping Slayers, and we've dealt with asbestos within the OPPD system for years. And we've never ever had any problems, any complaints. They're a group that is so well organized and so well planned, we've never had any problems with any type of removal project. It's a great place to work. It truly is. And again, that's attributed to the leadership and management. So without repeating myself, I thank you for the opportunity to address the NRC. And again, OPPD is an important part of our industry. (FCSD-C-1)

MR. CAMERON: Okay. Thank you, Rob. Is there anyone else who wants to make a comment or ask a question about any issue connected with license renewal or NRC's oversight? Okay. Great. Thank you all for coming out tonight and thanks to Camie for the stenography, and I think we're adjourned.

Omaha Public Power District

Fort Calhoun Station
P.O. Box 550, Highway 75
Fort Calhoun, NE 68023-0550

1/14/03
68 FR 1873
(2)

April 4, 2003
LIC-03-0048

Chief
Rules and Directives Branch
Mailstop T-6D 59
U. S. Nuclear Regulatory Commission
Washington, DC 20555

References: 1. Docket No. 50-285
2. Letter from NRC (J. Cushing) to OPPD (R. T. Ridenoure) dated January 6, 2003

SUBJECT: Comments on the Draft Plant-Specific Supplement 12 to the Generic Environmental Impact Statement Regarding Fort Calhoun Station, Unit 1 (TAC No. MB3402)

The Reference 2 letter transmitted for comments the draft plant-specific Supplement 12 to NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," regarding the renewal of the operating license DPR-40 for Fort Calhoun Station, Unit 1.

Attached are the Omaha Public Power District comments on draft Supplement 12 to NUREG-1437. None of the comments have an impact on the conclusions of that document. This letter contains no regulatory commitments.

Please contact T. C. Matthews at 402-533-6938 if you have any questions.

Sincerely,

S. K. Gambhir
Division Manager
Nuclear Projects

TCM/tcm

Attachment

Template = ADM-013

F-RIDS = ADM-03
Cell = J.S. Cushing (JXC9)

Employment with Equal Opportunity

c: E. W. Merschoff, NRC Regional Administrator, Region IV (w/o Attachment)
A. B. Wang, NRC Project Manager (w/o Attachment)
W. F. Burton, NRC Project Manager (w/o Attachment)
J. S. Cushing, NRC Project Manager
J. G. Kramer, NRC Senior Resident Inspector (w/o Attachment)
NRC Document Control Desk
Winston & Strawn (w/o Attachment)

LIC-03-0048
Attachment
Page 1

**Omaha Public Power District (OPPD) Comments on
Draft Supplement 12 of NUREG-1437,
"Generic Environmental Impact Statement
For License Renewal Of Nuclear Plants,"
Regarding Fort Calhoun Station, Unit 1**

FCSD-D-1 1. Executive Summary, Page xvii, Lines 22-24 – This sentence incorrectly indicates that the OPPD application addressed chronic effects from electromagnetic fields. Consistent with Table B-1 of 10 CFR Part 51, subpart A, Appendix B, OPPD did not address this "NA" issue in the Environmental Report (ER) submitted with the license renewal application. This sentence should be revised accordingly.

FCSD-D-2 2. Table 1-1, Page 1-9, Line 7 – Suggest adding a note to the "Permit Expiration or Consultation Date" column to indicate that the NPDES permit provides for ongoing water quality certification.

FCSD-D-3 3. Figure 2-2, Page 2-3 – The Note included within the figure should be removed or revised to refer the reader to Section 2.1.7. It appears this was taken directly from the OPPD ER.

FCSD-D-4 4. Section 2.1.3, Page 2-6, Lines 12 and 13 – This sentence indicates that the potable water supply is discussed in the subsections of this section. However, the municipal water supply and potable water use is discussed in Section 2.2.2. Therefore, the sentence should be revised to read, "Details of the once-through cooling system and groundwater withdrawals are discussed in the following sections."

FCSD-D-5 5. Section 2.1.3.1, Page 2-6, Line 22 – Delete text "and have recently been repeated at Fort Calhoun Station…"

FCSD-D-6 6. Section 2.1.4.1, Page 2-9, Lines 39-40 and Page 2-10, Lines 1-8 – Revise text as follows, "…tanks located in the containment building**,** **and** auxiliary building. ~~, and chemical and radiation protection (CARP) facility, respectively (OPPD 1999). Auxiliary and reactor wastes are then transferred to liquid waste collection tanks in the radioactive waste processing building (RWPB; OPPD 2001b). In this building~~ **In the Radioactive Waste Processing Building,** liquid wastes can then be processed through a charcoal filter and a demineralizer system, which remove most radioactive materials and dissolved solids. Hotel wastes can also be processed through the filters and demineralizer if necessary. The processed liquid waste is collected in one of two liquid-waste monitoring tanks and is sampled before being released to the overboard header. The overboard header is the only path through which liquid radioactive waste from the **plant** ~~containment building, auxiliary building, CARP facility, and the RWPB~~ can be released to the environment.

FCSD-D-7 7. Section 2.1.4.1, Page 2-10, Line 15 – Correct this sentence to read, "...discharged directly to the ~~condenser~~ **Raw Water System and then to the** circulating-water-discharge tunnel.

FCSD-D-8 8. Section 2.1.5, Page 2-13, Line 2 – Directional qualifiers used in this sentence are contradictory. Delete "on the northeast portion of the facility."

FCSD-D-9 9. Section 2.1.5, Page 2-13, Line 18 – Insert "presently" between "are" and "taken"

FCSD-D-10 10. Section 2.2.2, Page 2-18, Line 8 – The rate of water use should be indicated; therefore, revise the sentence to read, "...approximately 38 million L (10 million gal) **per month** of filtered, ..."

FCSD-D-11 11. Section 2.2.2, Page 2-18, Line 15 – Delete "ionics"

FCSD-D-12 12. Section 2.2.3, Page 2-19, Line 26 – This sentence indicates that temperature increase of the cooling water flowing through the main condensers at maximum power is approximately 12°C. In the license renewal environmental report (Section 3.1.3.2), OPPD states this temperature increase as a nominal temperature rise of 23°F. This equates to approximately 13°C rather than 12°C as stated in the SEIS, and should be changed. For clarification, a temperature increase of 23°F is applicable to summer conditions when ambient river temperatures are warm; however, OPPD notes that this temperature rise may be several degrees warmer when ambient river water temperatures are cooler because of increased thermal efficiency of the condensers.

FCSD-D-13 13. Section 2.2.3, Page 2-19, Line 31 – This sentence indicates that average change in river temperature would be approximately 1°C (2°F) in a turbulent mixing system. However, using lowest monthly average river flow (January) of 20,982 and discharge temperature of 23°F above ambient, OPPD calculates that the increase in river temperature after complete mixing would be only 0.5°C (0.9°F). It is unclear whether this represents a discrepancy; if so, it should be resolved.

FCSD-D-14 14. Section 2.2.3, Page 2-19, Lines 31-34 – Revise as follows: "During the winter, the total change in temperature may be greater as the upstream discharge of cooling water is performed to melt any ice in the river to prevent icing of the intake structure. **Under normal winter operating** ~~these~~ conditions, the total change in temperature may be as high as 18°C (32°F) between the intake and discharge of the cooling waters."

FCSD-D-15 15. Section 2.2.5, Page 2-22, Lines 10-12 – Revise sentence to read, "Fish Creek, **a small tributary that outfalls to the Missouri River, on the Fort Calhoun Station site** ~~which is located on Fort Calhoun Station and is the lowermost segment of the Missouri River,~~ provides little available..."

FCSD-D-16 16. Section 2.2.5, Page 2-25, Line 1 – For clarity, revise the sentence to read, "There are six **listed** species that could …"

FCSD-D-17 17. Section 2.2.5, Page 2-25, Lines 26-29 – The location of the Platte River relative to Fort Calhoun Station should be noted.

FCSD-D-18 18. Section 2.2.5, Page 2-25, Line 35-37 – This sentence implies that the amount of suitable habitat for the pallid sturgeon was discussed; however, the previous paragraph does not clearly discuss this point. Recommend enhancing the pallid sturgeon discussion to provide the basis for this sentence.

FCSD-D-19 19. Section 2.2.7, Page 2-33, Lines 27-34 – OPPD has submitted corrections to data provided in the 2001 annual report (letter from OPPD (R. T. Ridenoure) to NRC (Document Control Desk) dated April 4, 2003 (LIC-03-0039)). As a result, the following changes should be made:

- The air dose due to noble gases in gaseous effluents was 3.24 x 10-3 mSv (3.24 x 10-1 mrad) gamma (3.24 percent of the 0.10-mGy [10-mrad] gamma dose limit) and 1.19 x 10-2 mGy (1.19 mrad) beta (5.95 percent of the 0.20-mGy [20-mrad] beta dose limit)
- The critical organ dose from gaseous effluents due to iodine-131, tritium, and particulates with half-lives greater than eight days was 4.83 x 10-2 mSv (4.83 mrem), which is 24.15 percent of the 0.15-mSv (20-mrem) dose limit.

Note: The corrected data above for 2001 was submitted along with the 2002 Annual Radiological Effluent Release Report. The NRC may want to use the 2002 data. Whichever data is used, the reference citation should be changed accordingly.

FCSD-D-20 20. Section 2.2.8.2, Page 2-37, Line 24 – As indicated Highway 75 is a US highway not an interstate. Therefore, the parenthetical, "(I-75)", should be deleted.

FCSD-D-21 21. Section 2.2.8.5, Page 2-40, Line 11 - There is inconsistency between the population numbers cited for the 50-mile radius (760,514) on this page and that indicated in Table 2-8 (852,711).

FCSD-D-22 22. Section 2.2.8.6, Page 2-44, Line 15 - Source of information in the table is cited as OPPD's environmental report (ER). The ER does not cite a year 2002 in lieu payment so a new reference is needed.

FCSD-D-23 23. Section 2.2.9.1, Page 2-45, Line 19 – Correct "east" to "west"

FCSD-D-24 24. Section 2.2.9.1, Page 2-45, Line 29 and 36 – In Line 29 reference "Radin 1923" is not listed in the Section 2.3, References. In Line 36 the "Iowa" should be corrected to "Ioway."

FCSD-D-25 25. Section 2.2.9.2, Page 2-47, Line 21 – For clarity, indicate that U.S Highway 73 is now known as U.S. Highway 75.

FCSD-D-26 26. Section 2.2.9.2, Page 2-48, Line 31 – The reference citation "McDonald 1926" is not listed in Section 2.3, References.

FCSD-D-27 27. Section 2.2.10, Page 2-49, Line 41 – The reference citation "FWS (2001b)" appears to be incorrect. Reference to the 1990 Biological Opinion is made in the more recent FWS Biological Opinion cited as "FWS (2000)".

FCSD-D-28 28. Section 4.4.1, Page 4-27, Lines 5-7 – It should be clarified that the density values provided in this sentence is for the 50-mile region. Also, there is inconsistency between the population numbers cited for the 50-mile radius (760,514 vs. 852,711 vs. 852,717) in Sections 2.2.8.5 and 4.4.1.

FCSD-D-29 29. Section 4.4.1, Page 4-28, Line 4 - The year 2000 population for the Omaha MSA was stated as 716,998 in OPPD's ER. No population number was given in the ER for the Omaha MSA's 1990 population. Therefore, suggest correcting the sentence to read, "...population was **approximately 716,998 in the year 2000** (OPPD 2002)."

FCSD-D-30 30. Section 4.4.5, Page 4-32, Lines 19-27 – As written, it is hard to differentiate between the exclusion zone (about 1265 acres) and that portion of the exclusion zone that constitutes the plant site (about 660 acres). OPPD owns the plant site, which lies entirely in Nebraska, and has perpetual easements on the remainder of properties in the exclusion zone, which lie mostly in Iowa (see ER section 2.1.3 and Figure 2.1-3). Suggest revising this paragraph accordingly. In Line 26 delete "in Nebraska" given that the plant site lies entirely in Nebraska and OPPD doesn't own property in Iowa.

FCSD-D-31 31. Section 4.4.6, Page 4-34, Line 31 – NRC identifies Colfax county as having minority population; however, this county is not listed as one of the counties falling within the 50-mile radius (see lines 15-17).

FCSD-D-32 32. Section 8.1, Page 8-2, Line 22 and Page 8-3, Lines 22-29 – The NRC's conclusions regarding the impacts related to OPPD's payments in lieu of taxes is inconsistent between these two sections and does not follow from the current state requirements for such payments as appropriately described by the NRC on page 8-3, lines 12-20. Irrespective of the existence of FCS, OPPD would remain the retail supplier of electricity in its service territory and, in accordance with these state requirements, OPPD would continue to pay jurisdictions that now receive these payments, which are computed on the basis of a fixed payment established in 1957 and annual gross revenue from electricity sales. Therefore, termination of FCS operation would have no appreciable effect on these revenues and no associated impact would result. Discussion in Table 8-1 and Page 8-3 lines 22-29 should be revised accordingly.

FCSD-D-33 33. Section 8.1, Page 8-2, Lines 24-25 and Page 8-4, Lines 9-26 – The NRC's impact assessment with respect to historic and archeological resources is made in consideration of site land use following decommissioning (line 11). It not clear that future site land use is appropriately within the scope of license renewal except as considered in the context of developing alternative generation facilities on the site, and this aspect appears not to be considered for other impact categories. This approach is further confusing in that the potential impacts related to future land use are attributed to "decommissioning" later in the text (line 20). The NRC recognizes decommissioning and termination of operations as different actions in both the GEIS and its recently issued Supplement 1 to NUREG-0586, and neither of these actions appears to include disposition or use of the plant site following these actions. Suggest revising this paragraph accordingly.

FCSD-D-34 34. Section 8.1, Page 8-4, Lines 9-26 – The location of resources of concern (DeSoto Town Site), which occur on the relatively undisturbed uplands between the rail spur and Highway 75, is unclear from the description, partly as a result of confused directions. The following revisions are suggested:

- Line 16 - Include a callout to Figure 2-3; replace "western" with "uplands in the southern"
- Line 17 – Replace "southern" with "northern".
- Line 22 – Replace "northern" with "southern".
- Line 23 – Revise the sentence beginning on this line to read as follows (or equivalent): "Disturbance of this area, which lies south of the current railroad right-of-way, could have MODERATE to LARGE impact."

FCSD-D-35 35. Section 8.2, Page 8-6, Lines 24-30 – This paragraph appears to be misplaced, and seems more appropriately inserted after line 14 on page 8-7. In addition, in view of the NRC's assumption of consistency with OPPD's LRA ER, the plant size should be changed from 508-MW to 500-MW.

FCSD-D-36 36. Section 8.2, Page 8-6, Footnote b – This footnote refers only to the coal-fired alternative, so the first sentence should be deleted. Also, in view of the NRC's assumption of consistency with OPPD's LRA ER, the plant sizes should be changed to approximately 500 gross MW and 475 net MW.

FCSD-D-37 37. Section 8.2.1, Page 8-7, Lines 19-20 – The amount of ash cited in this sentence (74,000 tons) is incorrectly indicated as the total amount of ash that would be collected and disposed on the site. However, 74,000 tons represents only the amount of ash OPPD estimates would require disposal; OPPD assumes that the balance of the ash would be recycled (LRA ER, Section 7.2.3.1). The sentence should be revised accordingly.

FCSD-D-38 38. Section 8.2.1.1, Table 8-2, Page 8-8, Line 7 – OPPD assumes that the NRC reduced

site acreage estimates provided by OPPD in its ER for a plant using a closed-cycle cooling system by 25-30 acres (average of 27 acres) as noted in the DSEIS, Table 8-3. Unlike the acreage estimates for land use, the estimate of 340 acres cited here for the Ecology impact category are not consistent with this assumption. It appears that acreage should be changed to 127 ha (313 ac).

FCSD-D-39 39. Section 8.2.1.1, Table 8-2, Page 8-9, Line 8 – The following comments relate to Socioeconomics entries on this table:

- Operating staff for the coal-fired plant indicated in the comments column for the FCS site alternative should be changed from 15 to 250 per OPPD's estimate in ER Section 7.2.3.1.
- It is unclear for both of the site options what is meant by tax and/or wage "impacts" described for the operation-phase in the comments columns. OPPD notes that there would be a decrease in regional economic benefits from net decrease in jobs (from 772 to 250 or 15 for the FCS site or Nebraska City site options, respectively); the Nebraska City site option would result in the greater of these losses to communities near FCS. Any impact from the standpoint of "property taxes" would be small because OPPD's in lieu payments would remain about the same, or could be reduced if net loss of jobs at FCS causes reduced population and thus reduced electric sales in a jurisdiction. OPPD suggests revision to clarify and make the respective assessments consistent with one another.

FCSD-D-40 40. Section 8.2.1.1, Table 8-2, Page 8-11, Lines 1-2 – The loss of 757 jobs at Fort Calhoun Station indicated in the Comment Column for the FCS site option appears to be based on an operating workforce estimate of 15, which is applicable only to the Nebraska City site option, since an operating workforce for a coal-fired plant is already in place there. The estimated operating workforce for the FCS site option is approximately 250. OPPD suggests replacing "loss of about 757 jobs" with "net loss of about 522 jobs".

FCSD-D-41 41. Section 8.2.1.1, Page 8-11, Lines 10-12 – The NRC indicates on Page 8-6, lines 25-27 that, unless otherwise indicated, assumptions and numerical values used in Section 8.2.1 are from OPPD's ER. However, OPPD did not estimate acreages needed for a once-through cooling option as stated in this section. It is suggested that the beginning of this sentence be reworded to "Based on OPPD's estimates for a closed-cycle cooling system, the NRC estimates that . . . ". Also, for consistency with Table 8-2 entries, it would seem appropriate to change "10 ha (25 ac)" to "10-12 ha (25-30 ac" on line 12.

FCSD-D-42 42. Section 8.2.1.1, Page 8-11, Line 17 – Text on this line should be revised to clarify that "30-m-wide (100-ft-wide)" refers to assumed transmission right-of-way width.

FCSD-D-43 43. Section 8.2.1.1, Page 8-12, Line 28 – For consistency with previously stated estimates

for land use requirements in Table 8-2, it appears that "60 ha (140 ac)" should be changed to "46 ha (114 ac)".

FCSD-D-44 44. Section 8.2.1.1, Page 8-13, Line 10 – OPPD assumes that the NRC reduced site acreage estimates provided by OPPD in its ER for a plant using a closed-cycle cooling system by 25-30 acres (average of 27 acres) as noted in the DSEIS, Table 8-3. Unlike the acreage estimates for land use, the estimate of 340 acres cited here for the Ecology impact category are not consistent with this assumption. It appears that acreage should be changed to "127 ha (313 ac)" if referring to the total acreage needed for the site. However, if the intention is to only discuss that portion of the acreage needed for developing coal and limestone delivery, storage, and handling facilities the appropriate acreage amount would be 200 acres. This discussion should be revised accordingly.

FCSD-D-45 45. Section 8.2.1.1, Page 8-13, Line 38 – It appears that the first sentence on this line should be deleted because this section is intended to address impacts of the once-through cooling option.

FCSD-D-46 46. Section 8.2.1.1, Table 8-3, Page 8-21, Lines 18-19 – As indicated on Line 4 of this page, no cooling ponds would be used for this alternative. Therefore, it appears that this entry for Groundwater Use and Quality should be "No change".

FCSD-D-47 47. Section 8.2.2, Page 8-22, Lines 3-4 – For clarity, OPPD suggests that the first sentence be revised to indicate that this section addresses impacts for a gas-fired plant considering two site options: the Fort Calhoun site and the Cass County site.

FCSD-D-48 48. Section 8.2.2, Page 8-22, Line 11 – It appears that the sentence indicating that "infrastructure changes would be SMALL to MEDIUM" is inadvertent and should be deleted, since this section is merely describing the facility, not associated impacts.

FCSD-D-49 49. Section 8.2.2.1, Page 8-23, Table 8-4, Line 7 – Since both the Fort Calhoun site and Cass County site have most onsite infrastructure required for the plant, OPPD suggests that the acreage requirements for the FCS site alternative be change to correspond to the requirement listed for the Cass County site; i.e., "10 ha (25 ac)". Also, since both sites have offices, parking, and most roads required, it would be appropriate to replace this text with "and related facilities", which may include onsite area needed for transmission and pipeline hookups, power block access road, etc.

FCSD-D-50 50. Section 8.2.2.1, Page 8-30, Lines 4-5 – As noted in comment 23, OPPD would continue to be the retail supplier of electricity in its service territory and, under current state rules, would continue its payments in lieu of taxes to the same jurisdictions, regardless of the ultimate source of power (e.g., purchased power, new plant).

FCSD-D-51 51. Section 8.2.2.2, Table 8-5, Page 8-32, Lines 6, 7, and 8 – Cooling ponds are not included in the representative plant alternative design as described in the introductory text on page 8-31. Therefore, OPPD suggests replacing "development of a cooling pond" with "use of a cooling tower" on line 6, deleting "and ponds" on line 7, and replacing entry in line 8 with "No change".

FCSD-D-52 52. Section 8.2.3, Table 8-6, Page 8-35, Line 6 – In view of the state's current rules for in lieu tax payments as discussed in previous comments, OPPD suggests replacing "tax base" with "tax and wage impacts from employee earnings" and add "In lieu tax payments would remain unchanged" in the Comments column entry for the FCS option.

FCSD-D-53 53. Section 8.2.2 – Note that in the OPPD ER, OPPD specifically limited the natural-gas-fired alternative at the Cass County site to closed-cycle cooling. Use of once-through cooling at this site is rendered impractical due to the limited availability of cooling water and limited ability of Four Mile Creek to handle associated discharge. NRC should reconsider the viability of a once-through system at this location.

FCSD-D-54 54. Section 8.2.3, Page 8-36, Line 9 – FCS does not have a cooling canal system. For accuracy, OPPD suggests deleting the word "canal" on this line.

FCSD-D-55 55. Section 8.2.3, Page 8-39, Lines 16-18 – In view of the state's current rules for in lieu tax payments as discussed in previous comments, OPPD suggests that this sentence be replaced with one indicating that OPPD's in lieu tax payments would remain essentially unaffected by FCS operations termination and decommissioning.

FCSD-D-56 56. Section 8.2.3, Table 8-7, Page 8-41, Lines 15, 16 – The bases for impact assessment in this table are inconsistent with the coal and gas alternatives in that cooling towers were assumed to be used for the closed-cycle cooling system (see pages 8-21 and 8-31) and this table address the use of cooling towers only in all areas except Groundwater Use and Quality. Suggest deleting mention of ponds on line 15 and replacing entry in line 16 with "No change".

FCSD-D-57 57. Section 8.2.5.4, Page 8-45, Lines 3-5 – For clarification, the 167-MW of hydroelectric generating capability mentioned here and in OPPD's ER (Table 7.2-3) denotes developed capability in the year 1998, not potential undeveloped capability. Therefore, the NRC may wish to revise or delete this text.

FCSD-D-58 58. Section 8.2.6, Page 8-51, Table 8-8, Line 7 – The NRC notes that the impact assumptions in this section for the gas-fired generation contribution are the same as those made in Section 8.2.2, adjusted for reduced generating capacity. As noted previously, since both the Fort Calhoun site and Cass County site have most onsite infrastructure required for the plant, OPPD suggests that the acreage requirements for the FCS site alternative be change to correspond to the requirement listed for the Cass

County site; i.e., "10 ha (25 ac)". Also, since both sites have offices, parking, and most roads required, it would be appropriate to replace this text with "and related facilities", which may include area needed for onsite transmission and pipeline hookups, power block access road, etc.

FCSD-D-59 59. Section 8.2.6, Page 8-52, Table 8-8, Line 4 – In the Comments column for the FCS site option, suggest replacing "the tax base" with " the tax and wage impacts from employee earnings". Suggest revising the entry for the Cass County site accordingly. OPPD suggests deleting use of the term "tax base" in this context, since that term is normally associated with property taxes. As indicated in previous comments, Nebraska rules require OPPD to make payments to jurisdictions in their service territory in lieu of taxes, primarily based on retail electricity sales (OPPD is the exclusive retail supplier). Therefore, there would be no change in these in lieu payments under this alternative. However, there would be a net loss of jobs in the region (difference between FCS employment and gas-fired plant employment), and associated reduction in economic activity. The text should be revised accordingly.

FCSD-D-60 60. Section 9.1, Page 9-4, Lines 30-32 – NRC incorrectly indicates that OPPD's license renewal application presents an analysis of chronic effects from electromagnetic fields. Mention of this "n/a" issue should be deleted from the sentence.

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Denver Federal Center, Building 56, Room 1003
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Denver, Colorado 80225-0007

April 01, 2003

ER 03/0040

11/14/03
68 FR 18173
(1)

Chief
Rules Review and Directive Branch
Division of Administrative Services
Mail Stop T 6 D59
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Sir or Madam:

The Department of the Interior has the reviewed the Draft Supplement Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 12, Regarding Fort Calhoun Station, Unit 1, Washington County, Nebraska and has the following comments.

ENDANGERED SPECIES ACT COMMENTS

On December 16, 2002, the U.S. Fish and Wildlife Service (USFWS) received a letter dated December 9, 2002, from the U.S. Nuclear Regulatory Commission (NRC) requesting comments on a Biological Assessment (Assessment) of the Potential Impacts to Threatened and Endangered Species Resulting from an Additional 20 Years of Operation of the Fort Calhoun Station (FCS), Unit 1, Nuclear Power Plant (TAC No. MB3402), located in Washington County, Nebraska. The Assessment determined that the proposed action is not likely to adversely affect the federally listed endangered pallid sturgeon (*Scaphirhynchus albus)* or the threatened bald eagle (*Haliaeetus leucocephalus).* In addition, the Assessment stated that the proposed action would have no effect on the federally listed threatened western prairie fringed orchid (*Platanthera praeclara*) and piping plover (*Charadrius melodus*), or the endangered least tern (*Sterna antillarum*). The December 9 letter requested concurrence from the USFWS.

FCSD-E-1 After reviewing the Assessment, the USFWS concluded that additional information was required before an evaluation could be completed to determine whether the USFWS would be able to concur with a not likely to adversely affect determination for the pallid sturgeon. The USFWS is concerned about the impact of heated water, which is released from the facility, on the pallid sturgeon. In the spring, increasing water temperatures are a spawning cue for the pallid sturgeon. Depending on the degree of increase in water temperature, and the distance downstream it can be detected, operation of the facility may or may not disrupt pallid sturgeon reproduction in the Missouri River. Therefore, in a letter dated January 13, 2003, the USFWS requested that NRC provide the following information:

FCSD-E-2 1. How warm is the released water after it is discharged from FCS?

FCSD-E-3 2. How far downstream does the released water travel before being fully mixed with the Missouri River water during the May - July time period? Does this distance vary under high and low flow conditions, and if so what is the variation?

Template = ADM-013

E-RIDS = ADM-03
Add = S.S. Cushing (SXC 9)

FCSD-E-4 3. How much does the warm water plume warm the Missouri River in total after mixing? Does the amount of warming vary under high and low flow conditions?

FCSD-E-5 4. During the pallid sturgeon spawning period (May - July), how far downstream (under high and low flow conditions) is a temperature change detectable? Is it detectable at the mouth of the Platte River?

FCSD-E-6 Although no pallid sturgeon spawning has been documented in the Missouri River between FCS and Gavins Point Dam, there does appear to be potential spawning habitat between Gavins Point Dam and Ponca State Park. If spawning does occur in this river reach, pallid sturgeon larvae may drift as far downstream as FCS and be susceptible to impingment and entrainment. According to the Assessment, the larval monitoring studies at FCS ended in 1977. Since the current operating license for FCS does not expire until 2013, the USFWS requested that the larval monitoring studies be reinitiated to verify that pallid sturgeon larvae are not being adversely affected by FCS operations.

FCSD-E-7

On February 4, 2003, the USFWS received a phone call from NRC stating that they would be responding to our January 13 letter, and would provide the requested information. As of March 24, 2003, the USFWS had not received a response from NRC.

If you have any questions regarding this matter, please contact Mr. Wally Jobman of the USFWS Nebraska Field Office at (308)382-6468, extension 16.

Sincerely,

Robert F. Stewart

Robert F. Stewart
Regional Environmental Officer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

APR 10 2003

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FCSD-E-7

Mr. Jack Cushing
Chief, Rules Review and Directives Branch
Division of Administrative Services
Mail Stop T6-D59
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Mr. Cushing:

RE: Generic Draft Environmental Impact Statement (DEIS) for License Renewal of Nuclear Plants, Supplement 12, Fort Calhoun Station, Unit 1

Pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has reviewed the document entitled, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 12, Fort Calhoun Station, Unit 1." The proposed federal action is the renewal of the Operating License (OL) for Fort Calhoun Station, Unit 1, near Omaha, Nebraska. The Generic DEIS discusses the proposed action of renewing the OL for Fort Calhoun Station, Unit 1. The Omaha Public Power District (OPPD) is the applicant for this renewal. The document also presents and analyzes energy production alternatives to the proposed federal action.

FCSD-F-1 Given the 10-year lead time for this action to be implemented and the absence of a discussion of past, present or reasonably expected future actions (including non-federal) that could reduce the assimilative capacity (heat) of the Missouri River, EPA rates the DEIS "EC-2" (Environmental Concerns-Insufficient Information). To address information deficiencies, EPA recommends that the Nuclear Regulatory Commission (NRC) discuss (in the Final EIS) the cumulative effects of current and projected heat contributors to the Missouri River within Fort Calhoun's geographic scope of impact/influence, or provide details of control strategies that OPPD could undertake under increasing discharge limitation scenarios. For the purpose of assisting the NRC with this analysis, EPA has enclosed a thermal discharge technical report and modeling data.

E-RIDS = ADM-03
cc: J. Cushing (JXC9)

Template = ADM-013

RECYCLE

EPA Comments on Generic Draft Environmental Impact Statement for License Renewal of Fort Calhoun Unit 1

General:

FCSD-F-2 The document does not mention whether power demands on the Fort Calhoun facility are expected to change significantly from present levels during the license renewal period (up to 20 years). If consumer power needs in the service area increase significantly, please clarify how this would this affect operations, expansions/upgrades, effluent release and waste quantity. The anticipated growth rate of the service area during the renewal period should be taken into consideration.

Specific:

FCSD-F-3 Page 1-1, Lines 21-23: The Draft Environmental Impact Statement (DEIS) states that "This OL will expire in August 2013. On January 9, 2002, the OPPD submitted an application to the NRC to renew the Fort Calhoun Station Unit 1 for an additional 20 years under 10 CFR Part 54." The EPA notes that application for renewal is submitted 11 years in advance of current Operating License (OL) expiration (2013). Given this time period, EPA believes that Nuclear Regulatory Commission (NRC) should be cognizant of the expectations of the Council on Environmental Quality (CEQ) with respect to information currency. Per the 1981 memorandum entitled "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," "...if the proposal has not yet been implemented, or if the EIS concerns an ongoing program, EISs that are more than 5 years old should be carefully reexamined to determine if the criteria in Section 1502.9 compel preparation of an EIS supplement. If an agency has made a substantial change in a proposed action that is relevant to environmental concerns, or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts, a supplemental EIS must be prepared for an old EIS so that the agency has the best possible information to make any necessary substantive changes in its decisions regarding the proposal. Section 1502.9(c)."

FCSD-F-4 Page 2-38, Lines 22-23: The DEIS states that "there are currently no growth-control measures in place to restrict development." Does this fact have utility for the decision-maker in the re-licensing process? If so, how would growth around the plant affect licensing considerations?

FCSD-F-5 Page 2-49, Lines 18-21: The DEIS limits discussion of cumulative impacts to only the U.S. Army Corps of Engineers' revisions of the *Missouri River Main Stem Reservoir System Master Manual* (1979). The CEQ regulations on NEPA are specific on the need for cumulative impacts analysis (Sec. 1502.16 Environmental consequences, Sec.1508.7 Cumulative effects and Sec. 508.8 Effects). The EPA recommends that the NRC evaluate all potential actions (increasing universe of thermal dischargers and planned OPPD expansions) and causes (drought, climate change) which may reduce available Missouri River cooling capacity over the renewed OL period. In making this evaluation, NRC should also keep abreast of potential Missouri River Master Manual (flow regime) revisions and, also, any water quality standards revisions that may be made by the State of Nebraska.

PREDICTION OF HEAT MIXING ZONE FROM THE FORT CALHOUN NUCLEAR POWER PLANT

INTRODUCTION

When power is produced in a steam electric plant, a large portion of the energy released from the fuel is lost in the form of heat and must be dissipated on the plant site. The Omaha Public Power District (OPPD) Fort Calhoun Nuclear Power Plant uses water from the Missouri River to cool condensers, generators and other components of the power plant. Water from the river is pumped through the plant in large volumes and is then discharged back into the river with heat as the only added pollutant.

In 2001, the Environmental Protection Agency (EPA), with the help of the United States Geological Service (USGS) and the Oregon Graduate Institute (OGI), collected and analyzed heat data from the Missouri River at Fort Calhoun and three other power plants owned by OPPD and the Nebraska Public Power District. The purpose of this study was to map heat in the Missouri River and to predict compliance with Nebraska State Water Quality Standards under various river conditions for the purpose of establishing appropriate NPDES permit limits.

STATE WATER QUALITY STANDARDS

Title 117 of the Nebraska Surface Water Quality Standards states that "The temperature of a receiving water shall not be increased by a total of more than 5° F (3°C) from natural outside the mixing zone." "For warm waters, the maximum limit is 90° F (32°C)." (Title 117 Chapter 4.003.01B). "Chronic mixing zones in Warmwater Class A streams shall be designated to not exceed 5,000 feet in length." (Title 117 Chapter 2.010.06A2). Chronic mixing zones are set based on the 7-day, 10-year low flow. (Title 117 Chapter 2.010.06C).

Translated to plain English, the Fort Calhoun plant must not discharge levels of heat which would cause the Missouri River to be warmed more that 5° F (from natural/upstream temperature) at the end of a 5,000-foot mixing zone under 7Q10 drought conditions. In addition, the plant must not cause the temperature of the Missouri River to exceed 90° F at the end of the mixing zone. This is an important limiting factor, since summer background temperature in the Missouri River can exceed 85° F at the same time that river flows are lowered by summer drought conditions or by a reduction of stream flow volume via U.S.Army Corps of Engineers' management actions.

ASSESSMENT OF KEY LIMITING CONDITIONS

Examination of records from several power plants and records of river conditions showed several key limiting conditions. The EPA's monitoring and modeling strategy was based on predictions of heat levels in the Missouri River under three key conditions:

- Winter 7Q10 - During the winter months (November-February-March) releases from the Gavin's Point Dam are low when navigation service is curtailed. Ice jams can also limit river flow significantly. Winter modeling was based on seasonal calculations of historical low flows and the presumption that the facility would operate at full generation capacity.

- Summer "Heat Season" 7Q10 - During the months of June-September, the hottest months of summer, air conditioners and other cooling devices drive a high demand for electricity, which in turn, equates to a higher heat discharge. In addition, river background temperatures can also be high during drought events. The EPA's modeling considered a range of background temperatures based on high-background temperatures that have been observed in recent years. Higher river temperatures have been observed in drought years, but the causal interaction of low flow and river heat are not fully understood. The EPA's modeling assumed that peak power demand, low flows and high river background temperature would occur concurrently.

- Summer "Heat Season" 7Q10 based on Master Manual Alternatives GP 1521 or GP 2021 - In these alternatives, the Corps propose reduced flows as low as 21,000 cfs from the Gavin's Point Dam during the "Heat Season" months. These releases would be somewhat lower than past summer releases in the historic record. The EPA's modeling considered these lowered flows and the expected range of elevated river temperatures.

MONITORING AND MODELING METHODS

Modeling of predicted temperatures in the Missouri River was conducted using the CORMIX Mixing Zone Expert System. Monitoring of heat was conducted by the USGS in September of 2001, and then the modeling runs were optimized in order to most accurately reflect and predict the actual mapping of heat in the river. New runs, using optimized inputs, were used to predict mixing of heated discharges under the three limiting conditions.

The in-stream monitoring of heat was conducted using state-of-the-art methodology. The USGS measured river currents and bottom configuration using a boat-mounted Doppler system which is used for calibration of flow gages on the Missouri River. The Doppler system measured currents in three dimensions, at several depths, in closely spaced data sets. The data was tagged with Geographical Information System (GIS) data to map transects with great precision. Heat was measured using thermistors feeding data into a laptop computer at several levels in the water column. The combination of data sets allowed very accurate mapping of heat at each transect.

Optimization of CORMIX models was done by Stanley Wu at Oregon Graduate Institute under the direction of Dr. Robert Doneker (one of the key developers of the CORMIX system) in conjunction with his Masters thesis. Optimized runs were used by John Dunn, EPA, to assess permit limits under various assumptions of river background temperature.

FINDINGS

Summer Season

The key variable limiting heat discharges from the Fort Calhoun Nuclear Power Plant is not river flow, but ambient river temperatures. As temperatures in the Missouri River rise above 85° F toward the 90° F temperature cap, the capacity of the river to accept additional heat becomes progressively limited.

The EPA assessed observed river temperatures based on measurements at the cooling water intake for the Fort Calhoun facility. Modeling was based on the highest observed river temperatures (early August 2001), calculated Heat Season 7Q10 (both historical 7Q10 and a modified 7Q10 based on Master Manual revision alternatives GP 1521 or GP 2021), and peak power generation. The EPA models showed that the Fort Calhoun Facility is able to meet the current State of Nebraska Water Quality Standard for heat under all the assumptions shown above.

If river background temperatures increase above those historically observed, toward 88°F, then violation of standards can be expected based on EPA modeling. Observations of hourly temperature data suggest that these violations would exist for several hours at a time (based on daily peaks of river temperature in the afternoon and evening), and are likely to be repeated over a period of several days during a heat wave.

The EPA will suggest that NPDES permit limits for Fort Calhoun be based on allowing current peak heat discharges as the permit limit. In addition, detailed temperature monitoring would be required at the cooling water inlet, along with the outlet monitoring location that has been monitored in the past. If river background temperatures rise above historically observed peaks, then more restrictive heat limits might be required in the NPDES permit when it is renewed 5 years from now.

Winter Season

Flows in the Missouri River can be greatly reduced from summer conditions. Releases from the Gavin's Point Dam are also lowered, and there can be ice jamming in the cold months. Though winter flows are very low, thus resulting in a decrease in mixing efficiency, EPA's modeling indicates that the NDEQ state standards (allowing a 5° F temperature increase at the end of the mixing zone) are met under winter low-flow conditions.

Attachment: CD with set of CORMIX Models and Excel Spreadsheets on River Flow and Temperature.

A.3 References

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U.S. Environmental Protection Agency (EPA). 2003. Letter from U. Gale Hutton, Director, Environmental Services Division, EPA, to Jack Cushing, Nuclear Regulatory Commission. Subject: "The Generic Environmental Impact Statement for License Renewal of Nuclear Power 22 Plants, Supplement 12, Fort Calhoun Station, Unit 1." April 10, 2003.

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U.S. Nuclear Regulatory Commission (NRC). 2002. "Biological Assessment for License Renewal at Fort Calhoun Station, Unit 1, and request for Informal Consultation" from Pao-Tsin Kuo, U.S. Nuclear Regulatory Commission, to Steve Anschutz, U.S. Fish and Wildlife Service, Ecological Services Office, Grand Island, Nebraska. December 9, 2002.

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Appendix B

Contributors to the Supplement

Appendix B

Contributors to the Supplement

The overall responsibility for the preparation of this supplement was assigned to the Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission (NRC). The statement was prepared by members of the Office of Nuclear Reactor Regulation with assistance from other NRC organizations and the Lawrence Livermore National Laboratory. Representatives from Argonne National Laboratory, Pacific Northwest National Laboratory, Los Alamos National Laboratory, Energy Research Incorporated, and the Information Systems Laboratory also participated in this review.

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(a) Lawrence Livermore National Laboratory is operated for the U.S. Department of Energy by the University of California.
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(d) Pacific Northwest National Laboratory is operated for the U.S. Department of Energy by Battelle Memorial Institute.

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to the Omaha Public Power District's Application for License Renewal of Fort Calhoun Station, Unit 1

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to the Omaha Public Power District's Application for License Renewal of Fort Calhoun Station, Unit 1

This appendix contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC) and the Omaha Public Power District (OPPD) and other correspondence related to the NRC staff's environmental review, under 10 CFR Part 51, of the OPPD's application for renewal of the Fort Calhoun Station, Unit 1 operating license. All documents, with the exception of those containing proprietary information, have been placed in the Commission's Public Document Room, at One White Flint North, 11555 Rockville Pike (first floor), Rockville, MD, and are available electronically from the Public Electronic Reading Room found on the Internet at the following Web address: <http://www.nrc.gov/reading-rm.html>. From this site, the public can gain access to the NRC's Agencywide Documents Access and Management System (ADAMS), which provides text and image files of NRC's public documents in the publicly available records component of ADAMS. The ADAMS accession number for each document is included below.

January 9, 2002	Letter from Mr. W. G. Gates, OPPD, to the NRC, submitting the application for the renewal of the operating license for Fort Calhoun Station Unit 1 (Accession No. ML020290333).
January 18, 2002	Letter from Mr. W. G. Gates, OPPD, to the NRC, regarding the revised application for the renewal of the operating license for Fort Calhoun Station Unit 1 (Accession No. ML020230166).
January 25, 2002	Letter from the NRC to Ms. Margaret Blackstone, W. Dale Clark Library, regarding the maintenance of documents related to the application by the OPPD for license renewal of Fort Calhoun Station Unit 1 for an additional 20 years (Accession No. ML020320120).
January 25, 2002	Letter from the NRC to Ms. Ruth Peterson, Blair Public Library, regarding the maintenance of documents related to the application by the OPPD for license renewal of Fort Calhoun Station Unit 1 for an additional 20 years (Accession No. ML020320226).

February 6, 2002	Letter from the NRC to Mr. Ross T. Ridenoure, OPPD, concerning the receipt and availability of the license renewal application for Fort Calhoun Station Unit 1 (Accession No. ML020370490).
February 12, 2002	Federal Register Notice of the receipt of the application for the renewal of Facility Operating License No. DPR-40 for Fort Calhoun Station Unit 1 for an additional 20-year period (67 FR 6551).
February 19, 2002	NRC press release announcing the availability of the license renewal application for Fort Calhoun Station Unit 1 (Accession No. ML020510116).
April 16, 2002	Letter from the NRC to the OPPD, forwarding the determination of acceptability and sufficiency for docketing, proposed review schedule, and opportunity for a hearing regarding an application from the OPPD for the renewal of the operating license for Fort Calhoun Station Unit 1 (Accession No. ML021070338).
April 16, 2002	Federal Register Notice of the receipt of the application for the renewal of Facility Operating License No. DPR-40 for Fort Calhoun Station Unit 1 for an additional 20-year period (67 FR 18639) (see correction dated April 22, 2002).
April 22, 2002	Federal Register Notice of the acceptance for docketing of the application and notice of opportunity for a hearing regarding renewal of License No. DPR-40 for Fort Calhoun Station Unit 1 for an additional 20-year period: Correction (67 FR 19599).
May 6, 2002	Letter from the NRC to the OPPD, forwarding the Notice of Intent to Prepare an environmental impact statement and conduct the scoping process for the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021270719).
May 10, 2002	Federal Register Notice of Intent to prepare an environmental impact statement and conduct the scoping process for the renewal of the operating license of Fort Calhoun Station Unit 1 (67 FR 31847).
May 15, 2002	Letter from the NRC to the Iowa Tribe of Kansas and Nebraska, inviting participation in the scoping process for the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021370142).

May 15, 2002	Letter from the NRC to the Sac & Fox Tribe of Missouri, inviting participation in the scoping process for the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021370121).
May 15, 2002	Letter from the NRC to the Santee Sioux Tribal Council, inviting participation in the scoping process for the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021370195).
May 15, 2002	Letter from the NRC to the Omaha Tribal Council, inviting participation in the scoping process for the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021360600).
May 15, 2002	Letter from the NRC to the Ponca Tribe of Nebraska, inviting participation in the scoping process for the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021370069).
May 15, 2002	Letter from the NRC to the Winnebago Tribal Council, inviting participation in the scoping process for the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021360560).
May 20, 2002	Notice of public meeting to discuss the environmental scoping process for the Fort Calhoun Station Unit 1 license renewal application (Accession No. ML021410091).
June 4, 2002	Letter from Mr. Al Berndt to the NRC, providing scoping comments on the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021890064).
June 5, 2002	Letter from the NRC to the U.S. Fish and Wildlife Service, requesting a list of protected species within the area under evaluation for the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021580460).
June 11, 2002	Letter from the NRC to the Nebraska Commission on Indian Affairs, inviting participation in the scoping process for the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021630109).
June 18, 2002	Letter from Dr. Sam Augustine to the NRC, providing scoping comments on the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021860433).

June 18, 2002	Letter from Mr. Louis Burgher to the NRC, providing scoping comments on the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021860437).
June 18, 2002	E-mail from Mr. Bret Voorhees to the NRC, providing scoping comments on the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021860452).
June 28, 2002	Documents submitted during the June 18, 2002, scoping meetings regarding the Fort Calhoun Station Unit 1 license renewal application (Accession No. ML021820453).
July 9, 2002	Letter from Mr. Michael J. McLarney to the NRC, providing scoping comments on the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021970485).
July 10, 2002	E-mail from Mr. John Pollack to the NRC, providing scoping comments on the Fort Calhoun Station Unit 1 license renewal (Accession No. ML021990682).
July 12, 2002	Summary of the public meeting to discuss the environmental scoping process for the Fort Calhoun Station Unit 1 license renewal application (Accession No. ML021960359).
July 15, 2002	Letter from the NRC to Ms. F. Mendenhall, providing information regarding studies related to strontium-90 radiation levels measured in deciduous teeth (Accession No. ML021970486).
July 16, 2002	Letter from the NRC to the OPPD requesting additional information regarding severe accident mitigation alternatives for Fort Calhoun Station Unit 1 (Accession No. ML022000582)
July 17, 2002	Summary of the site audit to support the review of the license renewal application for Fort Calhoun Station Unit 1 (Accession No. ML022000604).
September 18, 2002	Letter from R. T. Ridenoure, OPPD, to the NRC providing the OPPD's response to the request for additional information regarding severe accident mitigation alternatives in the Fort Calhoun Station Unit 1 license renewal application (Accession No. ML022660201).

September 26, 2002	Letter from S. Anschutz, U.S. Fish and Wildlife Service, to the NRC regarding the request for a list of protected species within the area under evaluation for the Fort Calhoun Nuclear Station license renewal (Accession No. ML022800413).
October 23, 2002	Memorandum to Docket File regarding clarification to the OPPD's response to requests for additional information regarding severe accident mitigation alternatives for the Fort Calhoun Station Unit 1 license renewal application (Accession No. ML022970490).
November 22, 2002	Letter from the NRC to the OPPD transmitting the environmental scoping summary report associated with the staff's review of the Fort Calhoun Station Unit 1 license renewal application (Accession No. ML023290470).
December 9, 2002	Letter from the NRC to the U.S. Fish and Wildlife Service. "Biological Assessment of the Potential Impacts to Threatened and Endangered Species Resulting From an Additional 20 Years of Operation of the Fort Calhoun Station Unit 1 Nuclear Power Plant" (Accession No. ML023450603).
January 6, 2003	Letter from NRC to the OPPD. "Notice of Availability of the Draft Plant-specific Supplement 12 to the Generic Environmental Impact Statement Regarding Fort Calhoun Station, Unit 1 (TAC No. MB3402)" (Accession No. ML030060482).
January 6, 2002	Letter from NRC to the OPPD. "Request for Comments on the Draft Plant-Specific Supplement 12 to the Generic Environmental Impact Statement Regarding Fort Calhoun Station, Unit 1 (TAC No. MB3402)" (Accession No. ML030020823).
January 8, 2002	Letter from NRC to U.S. Environmental Protection Agency . "Draft Supplement 12 to the Generic Environmental Impact Statement Regarding Fort Calhoun Station, Unit 1" (Accession No. ML030080342).
January 13, 2003	Letter from John Cochnar, U.S. Fish and Wildlife Service, to the NRC regarding the biological assessment for the Fort Calhoun Station, Unit 1 (Accession No. ML030240383).

January 14, 2003	Federal Register, Notice of Availability of the Draft Supplement 12 to the Generic Environmental Impact Statement and Public Meeting for the Fort Calhoun Station, Unit 1 (68FR1873).
January 23, 2003	NRC meeting notice announcing two public meetings (afternoon and evening meetings) in Omaha Nebraska on February 26, 2003, to receive comments on the Draft Supplement 12 to the Generic Environmental Impact Statement Regarding Fort Calhoun Station, Unit 1 (DSEIS) (Accession No. ML030270233).
February 26, 2003	Transcript of February 26, 2003, afternoon public meeting in Omaha Nebraska on DSEIS (Accession No. ML030640258).
February 26, 2003	Transcript of February 26, 2003,evening public meeting in Omaha Nebraska on DSEIS (Accession No. ML030640275).
February 26, 2003	Meeting slides from both public meetings in Omaha Nebraska on DSEIS (Accession No. ML030640346).
March 14, 2003	Letter from OPPD providing comments on the January 13, 2003, letter from the FWS on the pallid sturgeon (Accession No. ML030640275).
April 1, 2003	Comments from the United States Department of the Interior on the DSEIS for Fort Calhoun Station license renewal (Accession No. ML0301040270).
April 4, 2003	Letter from OPPD providing comments on the DSEIS for Fort Calhoun Station license renewal (Accession No. ML031040288).
April 10, 2003	Letter from U.S. Environmental Protection Agency providing comments on the DSEIS for Fort Calhoun Station license renewal (Accession No. ML031080144).
May 2, 2003	Summary of the April 8, 2003, teleconference with the U.S. Fish and Wildlife Service in support of the staff's review of the Fort Calhoun Station, Unit 1 license renewal application (Accession No. ML031260319).

May 5, 2003	Summary of the April 15, 2003, teleconference with the U.S. Environmental Protection Agency in support of the staff's review of the Fort Calhoun Station, Unit 1 license renewal application (Accession No. ML031260264).
May 30, 2003	NRC response to the U.S. Fish and Wildlife Service letter of January 13, 2003, requesting additional information for the Fort Calhoun Station, Unit 1, license renewal (Accession No. ML031500783).
May 30, 2003	NRC response to the U.S. Department of the Interior's comments on the Draft Plant-Specific Supplement 12 to the Generic Environmental Impact Statement Regarding Fort Calhoun Station, Unit 1 (Accession No. ML031500739).
June 20, 2003	NRC response to U. S. Environmental Protection Agency's comments on the Draft Plant-Specific Supplement 12 to the Generic Environmental Impact Statement Regarding Fort Calhoun Station, Unit 1 (Accession No. ML031710855).
July 2, 2003	United States Department of Interior, Fish and Wildlife Service, response to NRC's May 30, 2003, letter requesting concurrence on the biological assessment (BA) of the potential impacts to threatened and endangered species resulting from an additional 20-years of operation of the Fort Calhoun Station, Unit 1 (Accession No. ML031900415)

Appendix D

Organizations Contacted

Appendix D

Organizations Contacted

During the course of the staff's independent review of environmental impacts from operations during the renewal term, the following Federal, State, regional, and local agencies were contacted:

Cargill, Inc., Blair, Nebraska

Century 21, Omaha, Nebraska

City of Blair, Blair, Nebraska

County Tax Assessor's Office, Omaha Douglas Civic Center, Omaha, Nebraska

Douglas County Agricultural Extension, Omaha, Nebraska

Greater Omaha Workforce Development, Omaha, Nebraska

Iowa Department of Natural Resources, Des Moines, Iowa

Iowa Department of Natural Resources, Spirit Lake, Iowa

Iowa Tribe of Kansas and Nebraska, White Cloud, Kansas

Metropolitan Area Planning Agency, Omaha, Nebraska

National Park Service, Lewis & Clark National Historic Trail Office, Omaha, Nebraska

Nebraska Commission on Indian Affairs, Lincoln, Nebraska

Nebraska Game and Parks Commission, Fort Atkinson State Historical Park, Fort Calhoun, Nebraska

Nebraska Game and Parks Commission, Lincoln, Nebraska

Nebraska State Historical Society, Archaeology Division, Lincoln, Nebraska

Nebraska State Historical Society, State Historic Preservation Office, Lincoln, Nebraska

NP Dodge Real Estate, Blair, Nebraska

Appendix D

Office of Economic Development, Finance Department, Omaha, Nebraska

Omaha Tribe, Macy, Nebraska

Ponca Tribe of Nebraska, Niobrara, Nebraska

River Ecosystems, Inc., Crofton, Nebraska

Rural Planning Commission, Douglas County, Nebraska

Sac & Fox Tribe of Missouri in Kansas and Nebraska, Reserve, Kansas

Santee Sioux Tribe, Niobrara, Nebraska

University of Nebraska, Cooperative Extension Office, Blair, Nebraska

U.S. Army Corps of Engineers, Omaha District, Omaha, Nebraska

U.S. Department of the Interior, Denver, Colorado

U.S. Environmental Protection Agency, Region VII, Kansas City, Kansas

U.S. Fish and Wildlife Service, Bismarck, North Dakota

U.S. Fish and Wildlife Service, Boyer Chute National Wildlife Refuge, Fort Calhoun, Nebraska

U.S. Fish and Wildlife Service, DeSoto National Wildlife Refuge, Missouri Valley, Iowa

U.S. Fish and Wildlife Service, Grand Island, Nebraska

U.S. Fish and Wildlife Service, Pierre, South Dakota

Washington County Historical Society, Fort Calhoun, Nebraska

Winnebago Tribe, Winnebago, Nebraska

Appendix E

The Omaha Public Power District's Compliance Status and Consultation Correspondence

Appendix E

The Omaha Public Power District's Compliance Status and Consultation Correspondence

The list of licenses, permits, consultations, and other approvals obtained from Federal, State, regional, and local authorities for Fort Calhoun Station, Unit 1 is shown in Table E-1. Following Table E-1 are reproductions of consultation correspondence prepared and sent during the evaluation process of the application for renewing the operating license for Fort Calhoun Station, Unit 1.

Table E-1. Federal, State, Local, and Regional Licenses, Permits, Consultations, and Other Approvals for Current Fort Calhoun Station, Unit 1 Operation

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks
NRC	Atomic Energy Act 10 CFR Part 50	Operating license	DPR-40	August 9, 1973	August 9, 2013	Authorizes operation of Fort Calhoun Station, Unit 1.
FWS	Section 7 of the Endangered Species Act (16 USC 1536)	Consultation	NA	June 5, 2002	NA	Section 7 requires a Federal agency to consult with the FWS regarding whether a proposed action will affect an endangered or threatened species. The NRC started consultation on June 5, 2002, and is still in consultation with the FWS.
NSHS	National Historic Preservation Act, Section 106	Consultation	NA		NA	The National Historic Preservation Act requires Federal agencies to take into account the effect of any undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places.
NDEQ	Clean Water Act, Section 401	Certification	NPDES permit constitutes compliance.			Discharges during the renewal term
NDEQ	Federal Clean Water Act, Section 402	Industrial waste-water facility permit	NPDES permit NE0000418		March 31, 2006	Contains effluent limits for Fort Calhoun Station, Unit 1 discharges to the Missouri River.
NDEQ	Nebraska Statute 81-1513	Consent order in the matter of Omaha Public Power District – Fort Calhoun Nuclear Station	Case 2206		To be determined as conditions are met	Increases maximum discharge temperature limits from 43.3 °C (110 °F) to 44.4 °C (112 °F).

Table E-1 (contd)

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks
NGPC	Nebraska Statute 37-418	Scientific collecting master permit	Master permit 168		December 31, 2003	Collection of fish species (for radiological environmental monitoring programs)
NDNR	NAC Title 457	Surface-water authorization permits	D-1083, D-1100		Indefinite	Permits withdrawal of water from the Missouri River. Approval for up to approximately 1,400,000 L/min (370,000 gpm).
NDNR	NAC Title 456, Chapter 12	Groundwater well registrations	G-109801A-E, G-109802, G-109803, G-110639		Indefinite	One-time registration of onsite groundwater wells

FWS – U.S. Fish and Wildlife Service
NSHS – Nebraska State Historical Society
NDEQ – Nebraska Department of Environmental Quality
NGPC – Nebraska Game and Parks Commission
NDNR – Nebraska Department of Natural Resources
NAC – Nebraska Administrative Code

Appendix E

June 5, 2002

Mr. Steve Anschutz
U.S. Fish and Wildlife Service
Ecological Services Office
203 W. Second Street
Federal Building, 2nd Floor
Grand Island, Nebraska 68801

SUBJECT: REQUEST FOR LIST OF PROTECTED SPECIES WITHIN THE AREA UNDER EVALUATION FOR THE FORT CALHOUN NUCLEAR STATION LICENSE RENEWAL

Dear Mr. Anschutz:

The Nuclear Regulatory Commission (NRC) is evaluating an application submitted by Omaha Public Power District for the renewal of the operating license for its Fort Calhoun Nuclear Station Unit 1. The NRC is preparing a supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437) for this proposed license renewal, for which we are required to evaluate potential impacts to threatened and endangered species.

Fort Calhoun Station Unit 1 is located in Washington County, Nebraska on the southwestern bank of the Missouri River at river mile 646 (Figures 1 and 2). The Fort Calhoun site consists of approximately 660 acres most of which is cropland or developed facility areas. Areas of natural vegetation on the site consist mostly of highly disturbed woodlands and shrub land on the steep slopes in the southern portion of the site and riparian woodlands along onsite sloughs bordering the Missouri River.

The proposed action would include use and continued maintenance of existing plant facilities and transmission line and would not result in new construction or disturbance. The 7-mile-long transmission-line corridor passes through mostly cropland and connects to a substation west of Blair, Nebraska. Cooling water for the Fort Calhoun Station is withdrawn from the Missouri River to supply once-through cooling water to remove heat from the main condensers. Maximum water withdrawal for the plant during normal operation is approximately 371,000 gallons per minute.

To support the environmental impact statement preparation process and to ensure compliance with Section 7 of the Endangered Species Act, the NRC requests a list of species and information on protected, proposed, and candidate species and critical habitat that may be in the vicinity of the Fort Calhoun Nuclear Station and its associated transmission line.

If you have any comments or questions, please contact Mr. Thomas Kenyon, Environmental Project Manager, at (301) 415-1120.

Sincerely,

Original Signed By: PTKuo
Pao-Tsin Kuo, Program Director
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Enclosure: As stated

Docket No. 50-285

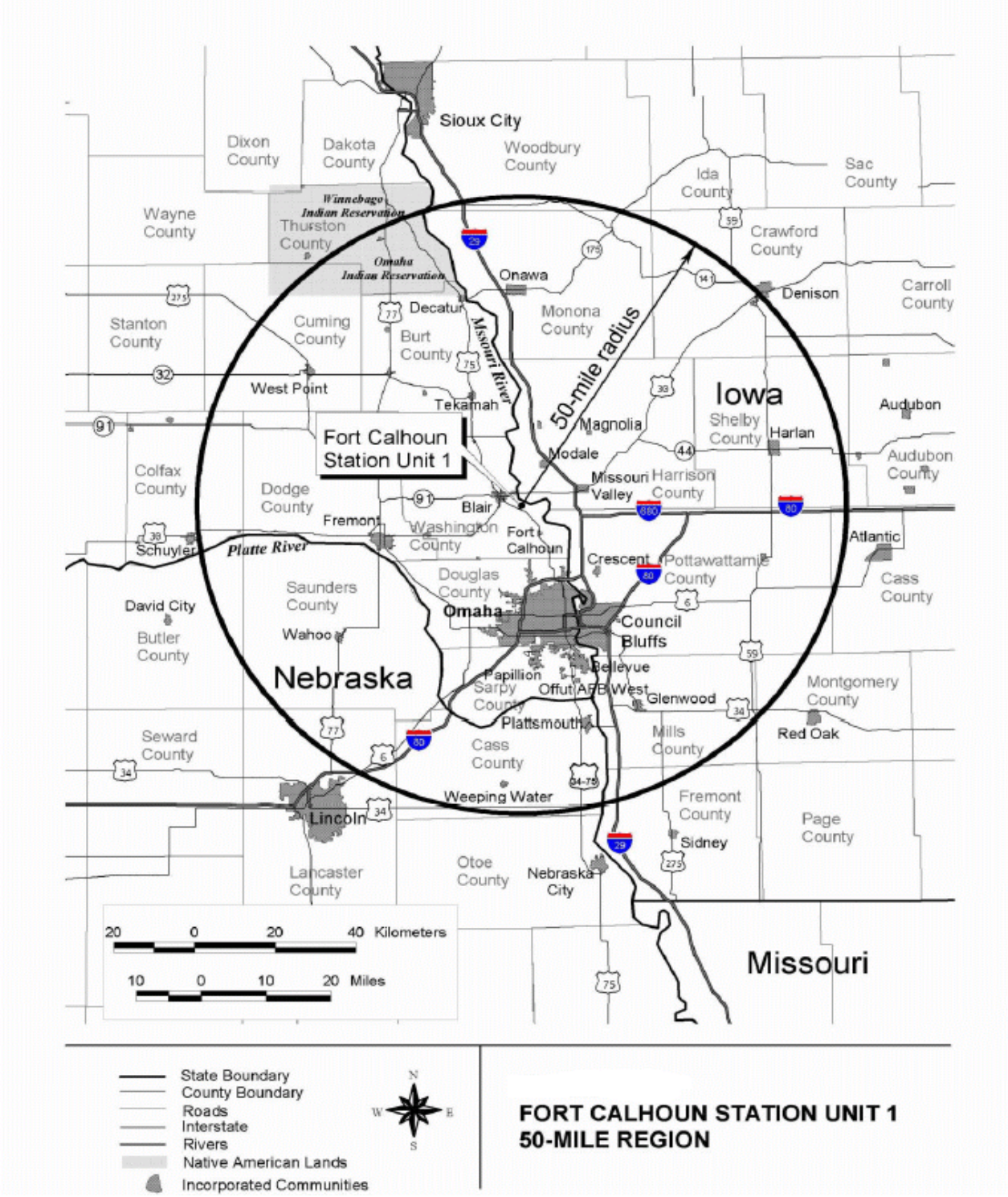

Figure 1. Location of Fort Calhoun Station, Unit 1, Nebraska.

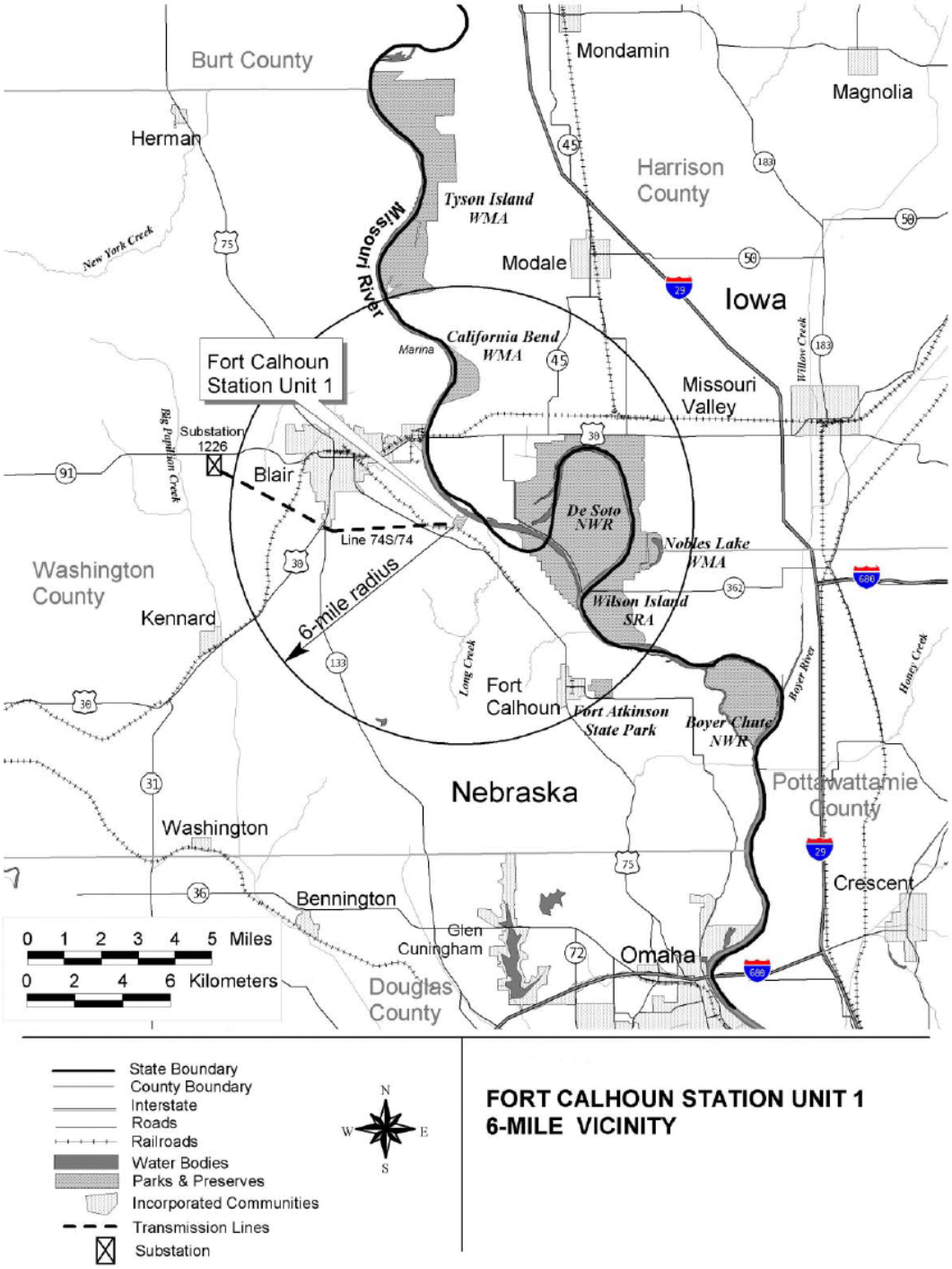

Figure 2. Vicinity of Fort Calhoun Station, Unit 1 and transmission line.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Nebraska Field Office
203 West Second Street
Grand Island, Nebraska 68801

September 26, 2002

U.S. Nuclear Regulatory Commission
Document Control Center
Attn: Mr. Pao-Tsin Kuo, Program Director
Washington D.C 20555-0001

RE: Request for List of Protected Species within the Area under Evaluation for the Fort Calhoun Nuclear Station License Renewal

Dear Mr. Kuo:

This is in response to your June 5, 2002, request for comments from the U.S. Fish and Wildlife Service (Service) regarding a proposed license renewal for the Fort Calhoun Nuclear Station (FCNS) which is located in Washington County, Nebraska on the southwestern bank of the Missouri River at river mile 646. The Service has completed its preliminary review of the proposed license renewal based on project details provided to this office and discussions at a June 20, 2002, meeting. The proposed action would include continued use and maintenance of existing plant facilities and a 7-mile transmission line. The 7-mile-long transmission line corridor passes through mostly cropland and connects to a substation located west of Blair, Nebraska. Water for the FCNS is drawn from the Missouri River to remove heat from cooling condensers at the station. No new construction is proposed as part of the license renewal. The Nuclear Regulatory Commission (NRC) is preparing a supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" for this proposed license renewal.

AUTHORITY

The following comments are intended to assist the NRC in its planning efforts and are provided as technical assistance to ensure the protection of Federal trust fish and wildlife resources, including federally listed species pursuant to the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), migratory birds pursuant to the Migratory Bird Treaty Act (16 U.S.C. 701 *et seq.*) and other fish and wildlife resources under the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401; 16 U.S.C. 661 *et seq.*). The Service participates in scoping and review of actions significantly affecting the quality of the environment under authority of the National Environmental Policy Act (NEPA) (42 U.S.C. 4321-4347). Additionally, the Service has authorities under several other legislative, regulatory, and executive mandates to promote conservation of fish and

wildlife resources for the benefit of the public. Please note that these comments do not constitute a report by the Secretary under the FWCA, nor does it absolve Federal agencies from meeting their responsibilities under Section 7 of ESA.

In Nebraska, the Service has special concerns for migratory birds, endangered and threatened species, and other important fish and wildlife resources. We also are concerned about any direct and/or indirect impacts on Federal and State wildlife refuges and management areas and other public lands, and other areas that support sensitive habitats. Habitats frequented by important fish and wildlife resources include wetlands, streams, and riparian (streamside) forests and woodlands. We give special attention to proposed developments that propose modification of wetlands, or stream alteration, or could result in contamination of important habitats. The Service recommends ways to avoid, minimize, rectify, reduce, or compensate for damaging impacts to important fish and wildlife resources and their habitats that may be attributed to actions proposed by Federal agencies.

FEDERALLY LISTED SPECIES AND DESIGNATED/PROPOSED CRITICAL HABITAT

Pursuant to Section 7 of ESA, every Federal agency, in consultation or conference with the Service, is required to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any Federally listed or proposed species and/or result in the destruction or adverse modification of designated and/or proposed critical habitat. In accordance with Section 7(a)(2) of ESA, the Federal agency should determine if any federally listed/proposed threatened or endangered species and/or designated/proposed critical habitat would be directly and/or indirectly affected by the proposed project. The assessment of potential impacts (direct and indirect) must include an "affect" or "no effect" determination and be presented to the Service in writing. If the Service agrees with the determination made by the Federal agency, this office would provide a letter of concurrence. If federally listed/proposed species and/or designated/proposed critical habitat would be adversely affected by the proposed project, the federal agency will need to formally request further Section 7 consultation with the Service prior to making any irretrievable or irreversible commitment of federal funds (Section 7 (d) of ESA), or issuing any federal permits or licenses.

In accordance with Section 7 of ESA, the Service has determined that the following federally listed and candidate species may occur in the proposed project area or be affected by the proposed project:

Listed Species	Expected Occurrence
Bald eagle (*Haliaeetus leucocephalus*)	Migration, winter
Pallid sturgeon *(Scaphirhnchus albus)*	Lower Platte River and Missouri River

Bald Eagle

The bald eagle, federally listed as threatened, nests, migrates, and winters statewide. Bald eagles utilize mature, forested, riparian areas near rivers, streams, lakes, and wetlands and occurs along all the major river systems in Nebraska. The bald eagle southward migration begins as early as October and the wintering period extends from December-March. Additionally, many bald eagles nest in Nebraska from mid-February through mid-August. Disturbances within 0.5-mile of an active nest or within line-of-sight of the nest could cause adult eagles to discontinue nest building or to abandon eggs. There is an active bald eagle nest located at Desoto National Wildlife Refuge (NWR) located across the river from the FCNS, but continued operation of the FCNS is unlikely to have an affect on the nest. Human disturbances and loss of eagle wintering habitat can cause undue stress leading to cessation of feeding and failure to meet winter thermoregulatory requirements. These affects can reduce the carrying capacity of preferred wintering habitat and reproductive success for the species. Bald eagles are attracted to the area by the abundance of migratory waterfowl found near the Desoto NWR during the fall and spring migrations. The potential for collisions with transmission lines can increase if lines are located near migration corridors and foraging habitats for bald eagles.

Pallid Sturgeon

The pallid sturgeon was officially listed as an endangered species on September 6, 1990. In Nebraska, the pallid sturgeon is found in the Missouri and lower Platte rivers. Floodplains, backwaters, chutes, sloughs, islands, sandbars, and main channel waters formed the large-river ecosystem that provided macrohabitat requirements for the pallid sturgeon, a species that is associated with diverse aquatic habitats. These habitats historically were dynamic and in a constant state of change due to influences from the natural hydrograph, and sediment and runoff inputs from an enormous watershed spanning portions of 10 states. Navigation, channelization and bank stabilization, and hydropower generation projects have caused the widespread loss of this diverse array of dynamic habitats once provided to pallid sturgeon on the Missouri River, resulting in a precipitous decline in populations of the species. Multiple age classes of pallid sturgeon may be impacted by withdrawal, circulation, and discharge of cooling water through power plants.

Early FCNS Operational Studies

Numerous studies were done in the mid-1970s to ascertain the affects of FCNS on the Missouri River fish community (see Hesse et al. 1982b for a collection of papers). Of particular interest to the Service were studies about the affects of impingement and entrapment on adult and juvenile fish (Hesse et al. 1982a) and entrainment on larval fish (Hergenrader et al. 1982) at FCNS. These studies were particularly valuable for the purpose of establishing a baseline about the fish community of the Missouri River. Detailed statistical analyses were done on the most abundant fish or larvae collected (i.e., freshwater drum *(Aplodinotus grunniens)*, carp *(Cyprinus carpio)*, and gizzard shad *(Dorosoma cepedianum)* where adequate sample sizes ensured adherence to assumptions of various statistical tests utilized, thus facilitating development of meaningful conclusions. The studies were valuable in terms of providing discussions about the most abundant fish, but limited by study design and sample size from

providing discussions for fish that were rare and/or were rarely collected, such as threatened and endangered fish including the pallid sturgeon. Conclusively, ascertaining cause and affect relationships between even the most abundant fish species and power stations were difficult because of the dynamic nature of the Missouri River.

The Service is unaware of additional work regarding the affects of the water circulation process at FCNS on pallid sturgeon, or if additional data has since been collected that could be compared with the baseline information collected in the studies mentioned above. The cooling water circulation process is selective in its affects by age class or size (i.e., entrainment may affect larvae, but not adult pallid sturgeon; entrapment may affect large adults, but not larvae or juveniles; and impingement may affect juveniles, but not larvae or adults). The Service recommends that the NRC develop and implement a program to monitor the affects of the water circulation process on multiple age classes of pallid sturgeon. To assist the NRC in developing a monitoring program that can support a determination whether cooling water circulation at FCNS may/may not adversely affect the pallid sturgeon, the Service recommends the following considerations be incorporated into the protocol. The following should not be considered as an all-inclusive listing because other considerations also may be valid.

1. Seasonal Affects: Pallid sturgeon and other fish exhibit seasonal habitat shifts. The combined affects of FCNS operational capacity, river characteristics, and seasonal habitat shifts may result in pallid sturgeons being susceptible to impact from the water circulation process. Further, high ambient summer temperatures may exacerbate the affects of heat entrainment on larvae.

2. Daily Affects: Larvae are thought to exhibit a photoperiod response possibly becoming more active at night than day.

3. Operational Affects: High power demand and hence high capacity power production will require a greater volume of water for cooling, exacerbating the affect of entrapment, impingement, and entrainment on fish. These affects may be observable during warm periods of the summer and winter seasons. These affects could have serious implications should increased power production coincide with abundant sturgeon larvae in the drift.

4. River Conditions: Current velocities approaching traveling screens can vary with river level (Schlesinger et al. 1982). Additionally, a greater percentage of the total river flow is required when river volumes are low.

5. Lateral Distribution: Fish are unevenly distributed across the lateral plane of a river due to the influence of current velocity, availability of dissolved oxygen, and presence of aquatic habitat. Thus, although water circulation may draw less than 5 percent of the total flow, that percentage may be from a portion of the lateral river where a large percentage of larvae are found.

6. Longitudinal Distribution: At some times of the year, adult fish may be present in sections of the unchannelized Missouri River between Ponca, Nebraska and Gavins Point Dam. Adults may winter in the middle Missouri River during the winter. Larvae and recently spawned fish may only be present during late spring or early summer.

7. Multiple-year Monitoring: The Service recommends that NRC consider developing and implementing a multiple-year monitoring program as a way to address variability inherent to the Missouri River.

Surrogate Group

Given the rarity of the pallid sturgeon, the Service recommends that the NRC monitor a group of fish with similar life history and habitat requirements. Results from the monitoring project may be used by the NRC to support a "affect/no affect" determination. For example, a suitable group of fish may be composed of shovelnose *(S. platorynchus)*, lake *(Acipenser fulvescens)*, and pallid sturgeons.

Review Monitoring Protocol

The Service would be willing to provide technical assistance with regard to development of the aforementioned monitoring protocol. Additionally, given their extensive experience with the Missouri River fishery, we also would recommend that you coordinate closely with the Nebraska Game and Parks Commission during development of the monitoring protocol.

Affect/No Affect Determination

The Service recommends that NRC consider the information provided above about the bald eagle and pallid sturgeon in making its assessment of potential impacts of the proposed license renewal on federally listed species, and in making the "affect/no affect determination," as discussed above. Further, the Service recommends that the lead Federal agency not limit its consideration of affect to just the above project information, but other potential affects as they become apparent during the course of other project studies and/or project development and modification.

MIGRATORY BIRD TREATY ACT

Under the Migratory Bird Treaty Act (16 U.S.C. 703-712: Ch. 128 *as amended*), take of migratory birds at transmission lines due to such causes as electrocution and collision is prohibited. Such impacts can be exacerbated if lines are located near foraging, nesting, and roosting habitats, or along migratory corridors. The 7-mile long transmission line is located near such habitats and the Missouri River, a migration corridor for a variety of migratory species. Thus, the Service recommends that the NRC conduct a study of the 7-mile transmission line to determine its affect on migratory birds. Should the study document that the transmission line has a negative affect on migratory birds, we recommend that mitigative measures be developed and implemented to offset such affects. The Avian Powerline

Interaction Committee prepared a useful reference regarding the affects of bird collisions with power lines (APLIC 1994). We recommend that NRC review the reference and use it in the development of the mitigation strategies, if necessary. The Service requests that NRC provide us with a copy of the recommended study once completed for review and comment. The results of such a study would be applicable to the "affect/no affect determination" for bald eagles as discussed above.

The Service appreciates the opportunity to provide comments on the proposed relicensing of FCNS. The NRC's involvement in assuming a shared responsibility for protecting federal trust fish and wildlife resources in Nebraska is also appreciated. Should you have any questions regarding these comments, please contact Mr. Robert Harms within our office at (308) 382-6468, extension 17.

Sincerely,

Steve Anschutz
Nebraska Field Supervisor

References

Avian Power Line Interaction Committee (APLIC). 1994. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison Electric Institute. Washington, D.C.

Hergenrader, G.L., L.G. Harrow, R.G. King, G.F. Cada, and A.B. Schlesinger. 1982. Larval fishes on the Missouri River and the effects of entrainment. Pages 185-223 *in* Hesse, L.W., G.L. Hergenrader, H.S. Lewis, S.D. Reetz, and A.B. Schlesinger, editors. 1982. The Middle Missouri River, a Collection of Papers on the Biology with Special Reference to Power Station Effects. Missouri River Study Group. 301 pp.

Hesse, L.W., Q.P. Bliss, and G.J. Zuerlein. 1982a. Some aspects of the ecology of adult fishes in the channelized Missouri River with special reference to the effects of two nuclear power generating stations. Pages 225-276 *in* Hesse, L.W., G.L. Hergenrader, H.S. Lewis, S.D. Reetz, and A.B. Schlesinger, editors. 1982. The Middle Missouri River, a Collection of Papers on the Biology with Special Reference to Power Station Effects. Missouri River Study Group. 301 pp.

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Missouri River, a Collection of Papers on the Biology with Special Reference to Power Station Effects. Missouri River Study Group. 301 pp.

cc: USFWS; Desoto NWR (Attn: Larry Klimek)
USFWS; Boyer Chute NWR (Attn: Brian Schultz)
NGPC; Lincoln, NE (Attn: Frank Albrecht)
NGPC; Lincoln, NE (Attn: Gene Zuerlein)
NGPC; Lincoln, NE (Attn: Julie Godberson)
NDEQ; Lincoln, NE (Attn: John Bender)
EPA; Kansas City, KS (Attn: Larry Long)

December 9, 2002

Mr. Steve Anschutz
U.S. Fish and Wildlife Service
Ecological Services Office
203 W. Second Street
Federal Building, 2nd Floor
Grand Island, Nebraska 68801

SUBJECT: BIOLOGICAL ASSESSMENT FOR LICENSE RENEWAL AT FORT CALHOUN STATION, UNIT 1, AND REQUEST FOR INFORMAL CONSULTATION (TAC NO. MB3402)

Dear Mr. Anschutz:

The NRC staff has prepared the enclosed biological assessment to evaluate whether the proposed renewal of the Fort Calhoun Station, Unit 1, operating license for a period of an additional 20 years would have adverse effects on listed species. This biological assessment covers the area of the Fort Calhoun Station, located in Washington County, Nebraska, on the southwestern bank of the Missouri River at River Mile 646 and the 7-mile-long transmission line corridor connecting to a substation west of Blair, Nebraska.

There are five threatened or endangered species; the pallid sturgeon, bald eagle, western prairie fringed orchid, piping plover, and least tern addressed in the attached biological assessment. The staff has determined that the proposed action is not a major construction activity and that it may affect, but is not likely to adversely affect, the pallid sturgeon and the bald eagle. It will have no effect on the remaining three species. No designated critical habitat for any of these five listed species is located near the proposed action. We are placing this biological assessment in our project files and are requesting your concurrence with our determination.

In reaching our conclusion, the NRC staff relied on the geographical information system data base information provided by the Nebraska Natural Heritage Programs and on research performed by the NRC staff and contractors, and a current listing of species provided by the Nebraska field office of the Fish and Wildlife Service.

If you have any questions regarding this biological assessment or the staff's request, please contact the license renewal project manager, Jack Cushing, by telephone at (301) 415-1424 or by e-mail at jxc9@nrc.gov.

Sincerely,

/***RA***/

Pao-Tsin Kuo, Program Director
License Renewal and Environmental Impacts
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No.: 50-285

Enclosure: As Stated

BIOLOGICAL ASSESSMENT OF THE POTENTIAL IMPACTS TO THREATENED AND ENDANGERED SPECIES RESULTING FROM AN ADDITIONAL 20 YEARS OF OPERATION OF THE FORT CALHOUN STATION, UNIT 1, NUCLEAR POWER PLANT

Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

December 2002

Appendix E

I. INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) is considering an application for renewal of the operating license for the Omaha Public Power District (OPPD) Fort Calhoun Station, Unit 1, (FCS) nuclear power plant for an additional 20 years. The purpose of this assessment is to provide information to the U.S. Fish and Wildlife Service (FWS) concerning the potential impacts of continued operation of FCS, Unit 1, on threatened and endangered species; the pallid sturgeon (*Scaphirhynchus albus)*, bald eagle (*Haliaeetus leucocephalus*), western prairie fringed orchid (*Platanthera praeclara*), piping plover (*Charadrius melodus*), and the least tern (*Sterna antillarum*). The assessment summarizes pertinent project information and existing data and discusses the potential consequences of the proposed action on these species. Based on life history information, habitats in the project area and along Line 74S/74, operational characteristics of the plant, existing data for impingement and entrainment, and known thermal plume characteristics, the staff concludes that continued operation of FCS during the proposed 20-year license renewal period may affect, but is not likely to adversely affect, either the pallid sturgeon or bald eagle and will have no effect on the western prairie fringed orchid, piping plover, or the least tern.

II. PROJECT DESCRIPTION

The proposed action includes the continued operation and maintenance of FCS on the Missouri River in eastern Nebraska, approximately 31 kilometers (km) (19 miles [mi]) north-northwest of downtown Omaha (Figure 1), under a renewed license from the NRC. FCS began commercial operation on August 9, 1973, and is currently licensed to operate through August 9, 2013 (OPPD 2002). NRC regulations (10 CFR Part 54) allow license renewal for periods of up to 20 years, which would extend the operation of FCS through August 9, 2033. All facilities associated with this action were constructed during the early 1970s and no new construction would be performed as part of the license renewal action (OPPD 2002).

III. DESCRIPTION OF PROJECT AREA

FCS is a nuclear-powered steam electric generating facility operated by OPPD. The facility is located in Washington County, Nebraska, on the southwestern bank of the Missouri River at River Kilometer (RK) 1040 (River Mile [RM] 646), approximately 266 km (165 mi) downstream of Gavins Point Dam. It is approximately 31 km (19 mi) north-northwest of downtown Omaha, Nebraska, and approximately 16 km (10 mi) north of the Omaha metropolitan area. The nearest municipality to the site is Blair, Nebraska, approximately 4.8 km (3 mi) northwest (upstream) (Figure 1) (OPPD 2002).

The FCS site consists of approximately 267 hectares (ha) (660 acres [ac])situated between U.S. Highway 75 and the Missouri River. Of this total, 55 ha (135 ac) are occupied by plant facilities or maintained as part of plant operations with an additional 140 ha (345 ac) used for cropland (corn and soybeans). The remaining 73 ha (180 ac) consist of a railroad spur, natural vegetation, and drainage courses. Areas of natural vegetation on the site consist mostly of highly disturbed woodlands and shrubland on the steeper slopes in the southern portion of the site and riparian woodlands along onsite sloughs bordering the Missouri River (OPPD 2002).

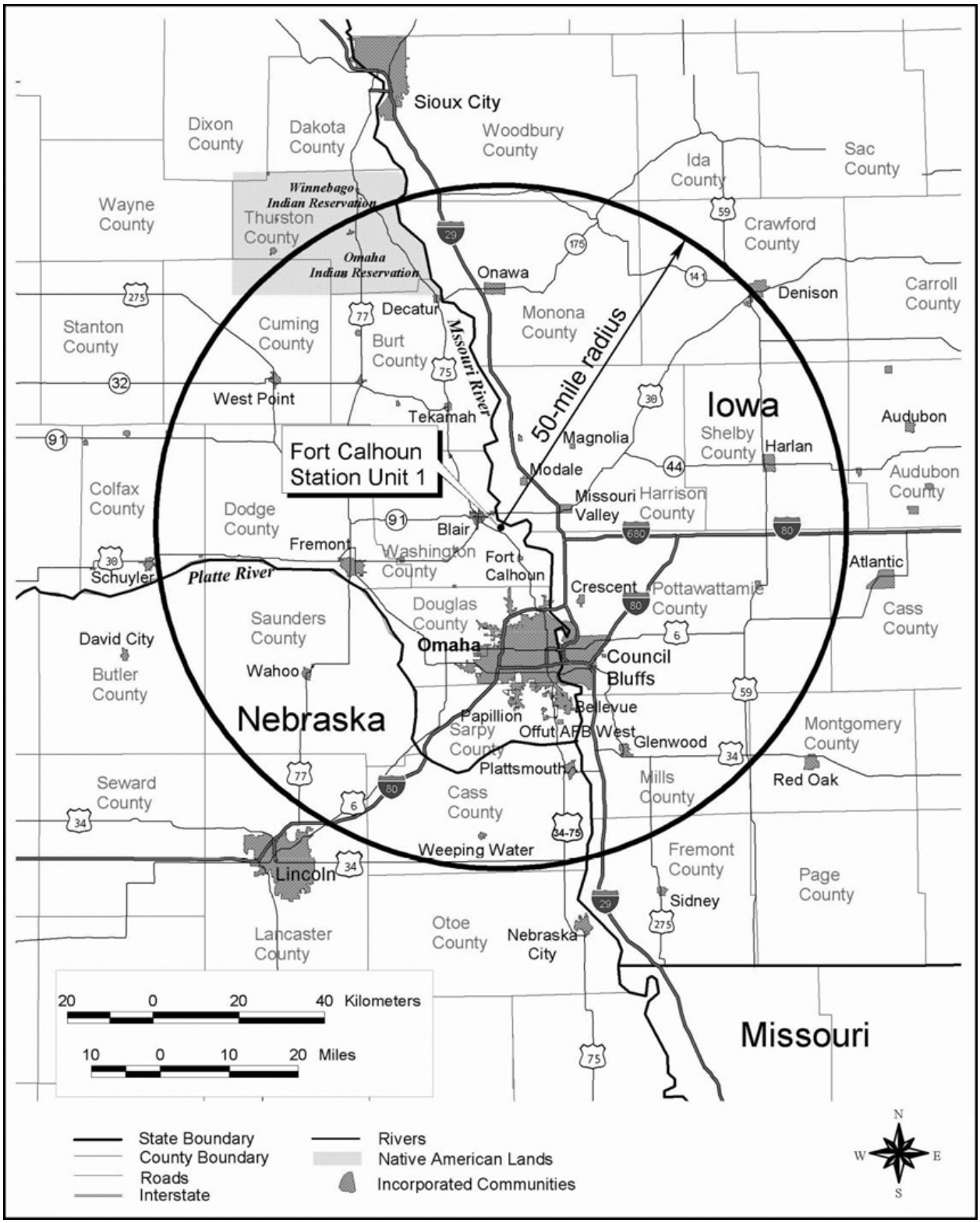

Figure 1. Location of the Fort Calhoun Station, Unit 1, Site

FCS is equipped with a nuclear steam supply system, consisting of a pressurized water reactor and its associated coolant system supplied by Combustion Engineering. The reactor was initially licensed to operate at a maximum power level of 1420 megawatt-thermal. It is currently licensed for a thermal power level of 1500 megawatt-thermal with an electrical power output of 510 megawatts-electrical and a net generating capability of the plant (i.e., electric power supplied to the grid) of 476 megawatts (summer rating). FCS generates approximately 3.6 terawatt-hours of electricity annually (OPPD 2002).

The transmission line of concern for license renewal is that which was constructed between the plant switchyard and the existing transmission system. For FCS, the only transmission line within the scope of review for license renewal is Line 74S/74, which is a 161 kV line that is approximately 11 km (7 mi) long and proceeds from the FCS Substation westward to Substation 1226, approximately 4 km (3 mi) west of Blair, Nebraska. This line is composed of two segments. Line 74S is a 1 km (0.5 mi) long, single-circuit line on a 15 m (50 ft) wide right-of-way. Line 74 is a 10 km (6.5 mi) long double-circuit line on a 100 ft right-of-way. Line 74S/74 was originally constructed in 1969 and provided a connection to the transmission grid once the plant became operational. The line was entirely reconstructed in 1999 to single steel poles and to the 1997 National Electrical Safety Code requirements that were in effect at the time.

Leaving the FCS Substation, Line 74S/74 traverses (for approximately 1.6 km or 1 mi) disturbed shrublands and woodlands, primarily on the hilly upland terrain of the Missouri River bluffs in the vicinity of U.S. Highway 75. For the remaining 9.7 km (6 mi) to the Blair Substation, this line is routed across agricultural cropland. The line crosses several small intermittent streams, but no other surface waters or wetlands are crossed. Land use adjacent to the right-of-way has undergone little change since initial construction; however, some additional development has occurred along U.S. Highway 30 near the line crossing, and new rural residential development has occurred along the north side of the line for approximately 1.2 km (0.75 mi) in the bluff area just west of U.S. Highway 75 (OPPD 2002).

FCS uses a once-through, non-contact system for cooling that withdraws water from an intake structure on the shoreline of the Missouri River and discharges to the river through a discharge tunnel 12.2 m (40 ft) downstream from the intake structure. The intake structure is contained within a reinforced concrete building that extends approximately 24.4 m (80 ft) along the riverbank at RK 1039 (RM 646). Maximum cooling water withdrawal for the plant during normal operation is approximately 371,000 gal/min (827 ft^3/s or 534 million gal/d) (OPPD 2002).

Average Missouri River flow rates measured at the gaging station in Omaha for the period between 1967 and 2000 provide an approximation of flow conditions at the FCS site. During the summer, the lowest monthly average flow rate occurs in August and is 1209 m^3/s (42,679 ft^3/s) with a monthly minimum flow rate of 861 m^3/s (30,409 ft^3/s). The maximum water intake at FCS during normal plant operations is 23 m^3/s (827 ft^3/s) and occurs during the summer due to higher river temperatures. This maximum water intake represents approximately two percent of the monthly average and 2.8 percent of the minimum river flow at that time. The lowest average river flows occur during the winter, with a monthly average flow rate of 594 m^3/s (20, 982 ft^3/s) and a monthly minimum flow rate of 313 m^3/s (11,060 ft^3/s) occurring in January. The normal water intake for FCS represents approximately 3.9 percent of the average and seven percent of the minimum river flow during this winter month (OPPD 2002).

At extreme low-flow conditions within the river (i.e., at a river surface elevation of 298 m or 978 ft), the average velocity of intake water through the sluice gates of the facility's intake structure is 0.9 m/s (2.8 ft/s). During low-flow conditions (i.e., at a river surface elevation of 300 m or 983 ft), the estimated approach velocity to the intake structure's traveling screens, located approximately 2.4 m (8 ft) beyond the sluice gates, is 0.34 m/s (1.1 ft/s). At normal river level conditions of approximately 302 m (992 ft), the estimated average approach velocity to the traveling screens is 0.2 m (0.7 ft/s) (OPPD 2002).

The reach of the Missouri River, on which FCS is located, has been modified through its entire length by a system of dikes and revetments designed to provide a continuous navigation channel without the use of locks and dams. The Missouri River at the site is approximately 183 m (600 ft) wide and 4.6 m (15 ft) deep. The banks are stabilized by filling-dams along the east bank and riprap along the west-cutting bank where plant facilities are located. The river bottomlands at the plant site are approximately 16 km (10 mi) wide. Agriculture is the predominant land use outside of incorporated areas in the upland region beyond the Missouri River bottomlands. The Platte River joins the Missouri River approximately 56 km (35 mi) south of the FCS site. There are two small streams on or adjacent to the site — Fish and Long Creeks (OPPD 2002).

IV. DESCRIPTION OF SPECIES IN PROJECT AREA

A. Pallid Sturgeon

The pallid sturgeon (*Scaphirhynchus albus*) was originally listed as endangered throughout its entire range by the FWS in 1990 due to a rapidly declining population (55 FR 36641 [FWS 1990]). The species continues to decline and is nearly extirpated from large segments of its former range and is only occasionally observed (FWS 2000).

The pallid sturgeon's historic range encompassed 5633 river km (3500 river mi) and was comprised of the Yellowstone, Missouri, middle and lower Mississippi Rivers, and the lower reaches of their major tributaries (i.e., the Platte, Kansas, and Yellowstone Rivers) (55 FR 36641 [FWS 1990]; FWS 2000). It is one of the largest fish species in the Missouri River, and grows to a length of over 1.8 m (6 ft), attains a weight of 45 kg (100 lbs), and has a lifespan of 60 years (55 FR 36641 [FWS 1990]; FWS 2000; FWS 2002a). This slow-growing and late-maturing species has a flattened, shovel-shaped snout, bony plate, and a long, reptile-like tail (FWS 2002a).

A sharp decline in pallid sturgeon observations occurred after the 1960s and over the entire range of the species, especially from the Gavins Point Dam to the Missouri River's headwaters. This decline continues and is largely a result of habitat modification, either directly (e.g., reduction of habitat diversity) or indirectly (e.g., alteration of food sources). Commercial fishing of a closely related species, the shovelnose sturgeon (*Scaphirhynchus platorynchus*), may also negatively impact the pallid sturgeon and this potential threat continues as the value of sturgeon roe increases (Davis 2000). Over the entire species' range, an average of 50 observations per year of the pallid sturgeon occurred in the 1960s with a subsequent decreasing trend. An average of 21 observations per year was noted in the 1970s and an average of seven observations per year in the 1980s (55 FR 36641 [FWS 1990]).

This represents an approximate 86 percent decline in observations of the pallid sturgeon over its entire range in 30 years.

Since 1980, the most frequent observations of this species were in the Missouri River. Relatively more frequent observations of the pallid sturgeon have been made near the mouth of the Platte River close to Plattsmouth, Nebraska (about 56 km or 35 mi downstream of FCS). Approximately 10 percent of the 872 observations of pallid sturgeon through 1998 have been made in the Missouri River below Gavins Point Dam (FWS 2000).

The pallid sturgeon feeds on snails, small fish, aquatic insects and plants, and other food resources from the river bottom. It requires large, turbid, and free-flowing habitat within rivers with a rocky or sandy substrate. The pallid sturgeon inhabits areas with swift-moving water (55 FR 36641 [FWS 1990]); bottom velocity in occupied areas range from 0.0 to 1.37 m/s (0 to 4.5 ft/s). The species inhabits areas with water temperatures between 0 °C (32 °F) and 30 °C (86 °F) (FWS 2000).

Macrohabitat requirements of the pallid sturgeon include floodplains, backwaters, chutes, sloughs, islands, sandbars, and main channel waters (FWS 2000). The average home range size of adults is estimated to be approximately 78.5 km (48.8 mi) in the upper Missouri River. Differences in movement patterns are influenced by seasonal factors (i.e., temperature and discharge) as well as differences between spawning and non-spawning years. Because the pallid sturgeon is a large fish, it is capable of moving large distances as it seeks favorable habitat. This produces a maximum home range of approximately 319 km (198 mi) with the pallid sturgeon capable of moving up to 21 km (13 mi) a day (FWS 2000).

Pallid sturgeon spawning is thought to be similar to that of other sturgeon species. Based on behavior of the closely related shovelnose sturgeon and some recent observations of successful pallid sturgeon spawning, it is believed that spawning occurs over rock, rubble, or gravel substrate in the main channel of the Missouri River and its major tributaries such as the Platte River. The optimum temperature for pallid sturgeon spawning is estimated to range from 16 to 18.3 °C (60 to 65 °F) (FWS 2000). Spawning occurs during the spring and early summer in the Missouri River; in the middle Missouri River area, spawning is thought to occur primarily in May and June. Sturgeon spawn multiple times during this spring or early-summer period. They release their eggs at intervals in deep channels or rapids without further parental attendance. The eggs are demersal and adhesive and, therefore, not likely to drift downstream.

Larvae become buoyant or active immediately after hatching and may drift downstream. The behavior of young pallid sturgeon is poorly understood; however, recent research points to a downstream movement of larvae that begins immediately at hatching and continues for up to 13 days (FWS 2000). Scientists have used this information, in combination with water velocities, to estimate that larval pallid sturgeon may drift in the water column for a distance of 64 to 644 km (40 to 400 mi).

Recent pallid sturgeon recovery efforts include augmentation of its populations by releases of hatchery-reared fish. Despite such efforts, pallid sturgeon observations remain infrequent or rare. Similarly, evidence of successful reproduction and recruitment throughout its range is rare. However, recent collections of three pallid sturgeon larvae from the lower Missouri River indicate that suitable spawning habitat and hydrologic conditions remain in the lower Missouri

River below Gavins Point Dam or in the Platte River. Although collection efforts in the Missouri River have yielded these few pallid sturgeon larvae, their relative number to other species of collected larvae suggest that spawning success and larval abundance for the pallid sturgeon remains low (FWS 2000).

The Natural Heritage Program documented one occurrence of the pallid sturgeon in the Missouri River for Washington County, upstream of FCS, in 1985. Other occurrences have been documented further upstream (i.e., Burt County, two occurrences, one in 1995 and one in 1996) and downstream (i.e., Douglas County, one occurrence in 1992; Sarpy and Cass Counties, six occurrences, one each occurring in 1984, 1987, 1991, 1995, 2000, and 2001). All of these occurrences are within an 80.5 km (50 mi) radius of the FCS site (NGPC 2001). No pallid sturgeon have been observed at nearby DeSoto National Wildlife Refuge (FWS 2001).

Human activities have modified or eliminated most of the habitat and ecosystem conditions in the Missouri River to which the pallid sturgeon is adapted. The Missouri River underwent extensive modification resulting in 36 percent of its habitat inundated with reservoirs, 40 percent channelized, and 24 percent altered due to dam operations (FWS 2000). The FCS site is located within a reach of the Missouri River that has been channelized, with a relatively uniform width and swift current. This channel degradation results in a reduction of sediment and organic matter, flow modifications, and channel narrowing. These conditions result in unfavorable habitat for the pallid sturgeon. With the current overall water management regime of the Missouri River (i.e., without increased flows and with warmer water temperatures, between June and July), it is believed that the cues for spawning are no longer present (FWS 2000).

B. Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) was originally listed as endangered by the FWS in 1978, but population increases prompted downlisting to threatened status in 1995. Recovery goals for the species have generally been met or exceeded within the species range. In addition, population trends indicate that the bald eagle has recovered and is no longer in danger of extinction, nor is it likely to become in danger of extinction within the foreseeable future throughout all or a significant portion of its range. As a result, the bald eagle was proposed for delisting in 1999 (64 FR 36453 [FWS 1999]).

The bald eagle commonly nested along the Missouri River in Nebraska in the late 1800s (Nebraska Game and Parks Commission [NGPC] Undated a). Although bald eagles have built and attended many nests in Nebraska since the mid-1980s, few young have been successfully fledged. The wintering population of bald eagles in Nebraska is variable and has ranged from about 400 in 1984 to 1300 in 1992.

Bald eagles usually occur near large bodies of water, especially rivers, lakes, and reservoirs that provide a reliable food source and isolation from human disturbance. Large trees and snags along shorelines are used as perches and nest sites. During the fall and spring migrations, when most water is ice-free and milder weather conditions predominate, bald eagles may be seen along virtually any waterway or impoundment in Nebraska (NGPC Undated a). During the wintering period (December 15 to February 20), bald eagles

usually concentrate in areas where water remains free of ice and food is available. Bald eagles feed on fish and waterfowl.

The bald eagle is a common visitor to DeSoto National Wildlife Refuge, approximately 3km (2 mi) to the east of FCS, in the spring and fall, but has never successfully nested there (FWS 2001). Bald eagles nest along the Missouri River, and there is some potential for occurrence of nests along the river in Washington County. However, no bald eagle nests exist on the FCS site, and none are known to occur in the vicinity (OPPD 2002). Bald eagles were observed in the vicinity of the FCS during field surveys conducted in 1975 (OPPD 2002). Small numbers of migrants or winter visitors are occasionally observed on and near the site along the Missouri River and perch in the large cottonwoods that are present in floodplain areas. Occurrence of bald eagles along Line 74S/74 has not been documented and is not expected because that line does not cross the Missouri River or any other water bodies where bald eagle activities would occur. Further, the line crosses predominantly agricultural land and is near U.S. Highway 75 and residential development.

C. Other Species

Other Federally listed species that occur in eastern Nebraska are the western prairie fringed orchid, piping plover, and least tern. None of these species are likely to occur in the vicinity of the FCS site, as discussed below.

Western Prairie Fringed Orchid

The western prairie fringed orchid (*Platanthera praeclara*) is Federally listed as threatened. The species is a component of the North American tallgrass prairie and is found most often on unplowed calcareous prairies and sedge meadows (FWS 1996). It is dependent on sites with near-surface groundwater and consistently high soil moisture. The orchid will colonize disturbed prairies, but will persist only if the site reverts to prairie (NGPC Undated b). Its historic range in Nebraska included most of the eastern portion of the State. Current known populations of the western prairie fringed orchid in Nebraska are small and occur in Lancaster County near Lincoln, eastern Seward County, Hall County near Grand Island, and in several widely scattered populations in east-central Cherry County (NGPC Undated b).

The main cause of the decline in populations of the western prairie fringed orchid is loss of habitat (NGPC Undated b). Drainage projects, stream channelization, and irrigation withdrawals from shallow aquifers have depleted groundwater and reduce habitat suitability for this species. Agricultural practices such as annual tilling, overgrazing, and annual cutting during the growing season threaten existing populations.

Although the western prairie fringed orchid historically occurred in Washington County, no populations are known to occur in the county at present (FWS 1996). It is unlikely that the species occurs on or near the FCS site or along Line 74S/74 because of the lack of prairie and wetland habitat in these areas.

Piping Plover

The piping plover (*Charadrius melodus*) is Federally listed as threatened in Nebraska. The piping plover breeding habitat consists of open sparsely vegetated areas with alkali or unconsolidated substrates (67 FR 57638 [FWS 2002b]). In the northern Great Plains, piping plovers primarily breed in alkali lakes and wetlands, inland lakes, reservoirs, and rivers. In Nebraska, the piping plover historic breeding range included sandbars and beaches of the Missouri River and its tributaries (NGPC Undated c). Unvegetated sandbars in unchannelized reaches of the Missouri River along the northern border of the State currently provide some nesting habitat. Nesting also occurs along the Niobrara, Platte, and Loup Rivers; these three rivers are designated as critical habitat for this species (67 FR 57638 [FWS 2002b]). There is no designated critical habitat for the piping plover in the vicinity of the FCS site.

Water development, especially the damming and channelization of rivers, has eliminated the natural hydrologic cycles that created and maintained sandbar-nesting habitat. Reductions of annual peak flows have resulted in vegetation encroachment of sandbars and sediment trapped behind dams no longer contribute to downstream sandbar formation (FWS 2000). The result is a reduction in the availability of suitable sandbar nesting habitat for piping plovers.

Suitable sandbar habitat is not found in the FCS reach of the Missouri River. Piping plovers were formerly found at the nearby DeSoto National Wildlife Refuge (FWS 2001), but the last piping plover was seen there in 1977. Suitable habitat in the area has been lost to river channel modifications and regulated water releases from upstream dams.

Least Tern

The least tern (*Sterna antillarum*) is Federally listed as endangered. The historic nesting distribution of the least tern in Nebraska included unvegetated sandbars and beaches along the Missouri River and its tributaries, including the Niobrara, Platte, Loup, and Elkhorn Rivers (NGPC Undated d). This species occurs in habitats similar to those used by the piping plover as described above. Suitable riverine nesting habitats are dry, flat, sparsely vegetated sand and gravel bars that occur in a wide river channel. Like the piping plover, impoundments, river regulation, and channelization projects have greatly reduced or eliminated suitable nesting habitat.

Suitable sandbar habitat for the least tern does not occur in the FCS reach of the Missouri River. Least terns nested at the nearby DeSoto National Wildlife Refuge up to the 1970s, but are now observed only occasionally, even though formerly used nesting habitats at the refuge have been maintained (FWS 2001).

V. EFFECTS OF THE PROPOSED ACTION ON LISTED SPECIES

This section presents the anticipated effects of the proposed action on listed species in the vicinity of the FCS site. As discussed above, only the pallid sturgeon and bald eagle potentially occur in the vicinity of the site and are, therefore, the focus of this assessment. No designated critical habitat for these species exists in the area and no impacts to such habitat are anticipated.

A. Pallid Sturgeon

OPPD implemented an impingement and entrainment monitoring plan at the FCS intake during 1974-5. The program monitored fish impingement on FCS traveling screens, fish larvae in the Missouri River, and fish larvae entrained into the plant cooling-water systems. Based on the small percentage of fish larvae entrained, the fish taxa collected, few adult fish impinged, and the high natural mortality of fish during early life stages, the study concluded that impingement and entrainment at FCS would have minimal adverse effects on the fish populations in the stretch of the Missouri River near the FCS site. The Nebraska Department of Environmental Control (NDEC) reviewed and approved this report on January 19, 1977, concluding that the losses due to impingement and entrainment at FCS were within the acceptable range. The OPPD continued to conduct larval impingement and entrainment studies at FCS through 1977 and summarized the results of the entire program, which spanned the period from 1973 to 1977, in a comprehensive report. No adult, juvenile, or larval pallid sturgeon were collected during these impingement and entrainment monitoring studies (OPPD 1978; 2002).

FCS is sited, designed, and operated to minimize potential impacts to aquatic organisms such as the pallid sturgeon. There is scientific concern that the pallid sturgeon cannot reproduce in channelized habitats (Hesse 1995). FCS is located in a river reach that is entirely channelized and it is unlikely that spawning occurs in the vicinity of the facility. In addition, FCS operation withdraws a relatively low percentage of the total river flow during the summer (two percent of the monthly average flow and 2.8 percent of the minimum flow) when larval drift is occurring. The highest percentage of river flow is withdrawn at the FCS site in the winter (OPPD 2002) when neither spawning nor larval drift occurs.

The NGPC noted that the severe alteration of the Missouri River ecosystem has resulted in the near elimination of the pallid sturgeon from the river (NGPC 1992). Despite more recent habitat restoration projects and population augmentation efforts, the pallid sturgeon continues to decline (Krentz 2002; FWS 2000) and occurrences of this fish remain rare (FWS 2000; NGPC 2001). The lack of suitable habitat in the vicinity of the FCS site as a result of previous habitat modification and the rare documented occurrence of the pallid sturgeon, including larvae (FWS 2000), indicate a low potential for impingement or entrainment with the cooling water system associated with FCS.

Based on this review, the staff concludes that the continued operation of FCS for an additional 20 years may affect, but is not likely to adversely affect the pallid sturgeon.

B. Bald Eagle

Bald eagles occur in the vicinity of the FCS site predominantly during spring and fall migrations and during the winter. Continued operation of FCS could affect bald eagles if plant operations resulted in changes to conditions in the Missouri River that affected food availability (i.e., the availability of fish or waterfowl) or if Line 74S/74 presented a hazard to the eagle.

Discharges of heated water to the Missouri River during plant operation result in warmer water in the outfall area, and, during the winter, the resulting open water can attract eagles that would otherwise migrate further south. This additional open water increases food availability for bald eagles during the winter and represents a benefit to eagles.

Only one transmission line (Line 74S/74) is associated with FCS and is within the scope of the license renewal application review. On the basis of its design, location, and surrounding habitats, it is unlikely that the line could adversely affect the bald eagle. Line 74S/74 is an 11 km (7 mi) long 161 kV line that was completely reconstructed in 1999 to National Electrical Safety Code requirements that include configuration standards that reduce the hazard of raptor electrocution. Approximately 1.6 km (1 mi) of the line crosses old-field and woodland habitats of the Missouri River bluff; the remaining 10 km (6 mi) cross agricultural land. The Missouri River bluffs area that is traversed by the line is relatively developed and is traversed by U.S. Highway 75. The line does not cross the Missouri River, or any water body that might attract eagles or serve as travel corridors for the species. In addition, because of the level of disturbance and human activities, habitats along the line are not likely to be used by bald eagles. These conditions greatly reduce or eliminate the probability that bald eagles would accidentally strike the transmission line and be killed or injured.

The NRC assessed the impacts of transmission lines on avian populations in its Generic Environmental Impact Statement (GEIS) on the effects of nuclear power plant license renewal (NRC 1996). In the GEIS, the NRC concluded that mortality resulting from bird collisions with transmission lines associated with license renewal and an additional 20 years of operation would be of small significance. This conclusion was based on (1) the fact that existing literature does not indicate that collision mortality is high enough to result in population-level effects and (2) the lack of known instances where nuclear power plant lines affect large numbers of individuals in local areas. No new and significant information has been identified by the staff that would indicate that bald eagles have been adversely affected by Line 74S/74 and no bald eagle mortalities along Line 74S/74 have been reported by OPPD.

Based on this review, the staff concludes that the continued operation of FCS may affect, but is not likely to adversely affect the bald eagle.

C. Other Species

Because the western prairie fringed orchid, piping plover, and least tern are unlikely to occur in the vicinity of the FCS site or along Line 74S/74 corridor, the continued operation of FCS will have no effect on the western prairie fringed orchid, piping plover, and least tern.

VI. CONCLUSION

OPPD has no plans to conduct major refurbishment or construction activities at FCS for continued operations during the license renewal period; the proposed project is not a major construction activity. The proposed project is not located near designated critical habitat of any of the threatened and endangered species discussed in this assessment. Based on life-history information, habitats in the project area and along associated transmission Line 74S/74, operational characteristics of the plant, existing data for impingement and entrainment, and known thermal plume characteristics, the staff concludes that continued operation of FCS, Unit 1, during the proposed 20-year license renewal period may affect, but is not likely to adversely affect either the pallid sturgeon or bald eagle and will have no effect on the western prairie fringed orchid, piping plover, or the least tern.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Nebraska Field Office
203 West Second Street
Grand Island, Nebraska 68801

January 13, 2003

Mr. Pao-Tsin Kuo
Program Director
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Mr. Kuo:

This responds to your December 9, 2002 (received December 16, 2002), letter requesting comments from the U.S. Fish and Wildlife Service (Service) on a Biological Assessment (Assessment) of the Potential Impacts to Threatened and Endangered Species Resulting from an Additional 20 Years of Operation of the Fort Calhoun Station (FCS), Unit 1, Nuclear Power Plant (TAC No. MB3402), located in Washington County, Nebraska. The Assessment determined that the proposed action is not likely to adversely affect the federally listed endangered pallid sturgeon or the threatened bald eagle. In addition, the Assessment stated that the proposed action would have no effect on the federally listed threatened western prairie fringed orchid and piping plover, or the endangered least tern. The December 9 letter requested concurrence from the Service.

After reviewing the Assessment, the Service has concluded that additional information is required before an evaluation can be completed to determine whether the Service will be able to concur with a not likely to adversely affect determination for the pallid sturgeon. The Service is concerned about the impact of heated water, which is released from the facility, on the pallid sturgeon. In the spring, increasing water temperatures are a spawning cue for the pallid sturgeon. Depending on the degree of increase in water temperature, and the distance downstream it can be detected, operation of the facility may or may not disrupt pallid sturgeon reproduction in the Missouri River. Therefore, the Service requests that the U.S. Nuclear Regulatory Commission (Commission) provide the following information:

1) How warm is the released water after it is discharged from FCS?

2) How far downstream does the released water travel before being fully mixed with the Missouri River water during the May - July time period? Does this distance vary under high and low flow conditions, and if so what is the variation?

3) How much does the warm water plume warm the Missouri River in total after mixing? Does the amount of warming vary under high and low flow conditions?

4) During the pallid sturgeon spawning period (May - July), how far downstream (under high and low flow conditions) is a temperature change detectable? Is it detectable at the mouth of the Platte River?

Although no pallid sturgeon spawning has been documented in the Missouri River between FCS and Gavins Point Dam, there does appear to be potential spawning habitat between Gavins Point Dam and Ponca State Park. If spawning does occur in this river reach, pallid sturgeon larvae may drift as far downstream as FCS and be susceptible to impingment and entrainment. According to the Assessment, the larval monitoring studies at FCS ended in 1977. Since the current operating license for FCS does not expire until 2013, the Service requests that the larval monitoring studies be reinitiated to verify that pallid sturgeon larvae are not being adversely affected by FCS operations. The Service would be happy to work with the Commission to develop a larval monitoring study.

If you or members of your staff have any questions regarding this matter, please contact Mr. Wally Jobman within our office at (308)382-6468, extension 16.

Sincerely,

John Cochnar
Acting Nebraska Field Supervisor

(c)calhoun.ltr

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 30, 2003

Mr. John Cochnar
Acting Nebraska Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services Office, Nebraska Field Office
203 West Second Street
Federal Building, 2nd Floor
Grand Island, Nebraska 68801

SUBJECT: RESPONSE TO THE U.S. FISH AND WILDLIFE SERVICE LETTER OF JANUARY 13, 2003, REQUESTING ADDITIONAL INFORMATION, FOR THE FORT CALHOUN STATION, UNIT 1, LICENSE RENEWAL (TAC NO. MB3402)

Dear Mr. Cochnar:

The U.S. Nuclear Regulatory Commission (NRC) staff has prepared the enclosed response to the U.S. Fish and Wildlife Service's (FWS) letter dated January 13, 2003. Your letter requested additional information after reviewing the NRC's December 2002, biological assessment (BA) for the Fort Calhoun Station (FCS), Unit 1.

The BA addressed the expected impacts resulting from an additional 20 years of FCS operation on five federally threatened or endangered species having the potential to occur in the general vicinity of the station. The NRC staff concluded that renewal of the FCS operating license may affect, but is not likely to adversely affect, the pallid sturgeon and bald eagle, and will have no effect on the remaining three species. The NRC forwarded the BA to FWS in a letter dated December 9, 2002, and requested FWS concurrence in the NRC Staff's conclusions relative to the five species discussed in the BA.

In your January 13, 2003, response you stated that additional information was required before the FWS could concur with the NRC's determination of "not likely to adversely affect" for the endangered pallid sturgeon, *Scaphirhynchus albus*. You asked four specific questions regarding the thermal regime in the Missouri River below the Station discharge. In addition, your letter stated that larval fish monitoring studies at the FCS should be reinitiated to verify that pallid sturgeon larvae are not being adversely affected by FCS operations. The attachment to this letter provides responses to your request for information.

After an extensive review, the NRC staff still considers the December 9, 2002, BA to be its assessment of record for the FCS, as supplemented by the information contained in the attachment to this letter. The NRC continues to conclude that the proposed action may affect but is not likely to adversely affect the pallid sturgeon. The NRC staff has determined, based on the known distribution of the pallid sturgeon in the Missouri River, the volume of water withdrawn by the station, the extent of the thermal plume, life history information on the pallid sturgeon and related species, and the questionable value of additional larval sturgeon collection studies in the channelized portion of the Missouri River that there is no need to conduct additional larval monitoring studies at this time. The NRC requests your concurrence in its December 9, 2002, BA as supplemented by the attachment to this letter.

The NRC would like to clarify its schedule for the review of Fort Calhoun Station's license renewal application. The NRC is considering an application for renewal of the operating license for the Fort Calhoun Station, Unit 1 for an additional 20 years beyond the original license expiration date of 2013 (i.e., to 2033). The NRC is scheduled to issue the Final Supplemental Environmental Impact Statement (SEIS) by August 15, 2003, and will make its license renewal decision by November 2003. The renewed license, if issued, will supercede the original license and will be valid from date of issuance in November of 2003 until August 9, 2033.

If you have any questions regarding this response to your request for additional information, please contact the environmental license renewal project manager, Jack Cushing, by telephone at (301) 415-1424 or by e-mail at jxc9@nrc.gov.

Sincerely,

Pao-Tsin Kuo, Program Director
License Renewal and Environmental Impacts
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No.: 50-285

Enclosure: As stated

Response to U.S. Fish and Wildlife Service's
January 13, 2003 Request for Additional Information
Fort Calhoun Station, Unit 1, Nuclear Power Plant

Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

May 2003

Introduction

The U.S. Nuclear Regulatory Commission (NRC) is considering an application for renewal of the operating license for the Omaha Public Power District's (OPPD) Fort Calhoun Station, Unit 1 (FCS) for an additional 20 years beyond the expiration date of the current operating license (i.e., to 2033). The FCS is located on the west bank of the Missouri River at river kilometer RKm 1039 (River Mile [RM 646]) The renewed license, if approved, is scheduled to be issued by November 2003.

The NRC submitted a Biological Assessment (BA) to the U.S. Fish and Wildlife Service (FWS) on December 9, 2002 (NRC 2002). The NRC requested comments on the BA and concurrence on the conclusion that the proposed action (i.e., renewal of the operating license for FCS) may affect, but is not likely to adversely affect the pallid sturgeon and the bald eagle and will have no effect on the western fringed orchid, piping plover, or the least tern. One of the species that could potentially inhabit the Missouri River in the vicinity of the Station is the pallid sturgeon, *Scaphirhynchus albus*.

After reviewing the BA, the FWS indicated in its letter of January 13, 2003, that additional information would be required by the FWS related to the pallid sturgeon prior to taking any action on the NRC's request for concurrence (FWS 2003). The FWS requested additional information on FCS's thermal discharge plume as well as requesting re-initiation of larval fish monitoring studies in the vicinity of FCS to verify that pallid sturgeon larvae are not being adversely affected by station operations. This attachment responds to the FWS request for additional information.

Thermal Discharge

A cooperative effort was conducted among OPPD, the U.S. Environmental Protection Agency (EPA), and the Nebraska Department of Environmental Quality (NDEQ) to evaluate the characteristics of the thermal discharge from FCS using computer modeling (CORMIX) and field verification (OPPD 2003). The purpose of this effort was to map heat in the Missouri River and to predict compliance with the Nebraska State Water Quality Standards under various river conditions for the purpose of establishing the appropriate national pollution discharge elimination system (NPDES) permit limits. The results from the recent CORMIX study have been used, in addition to past studies at FCS, as the basis for the NRC's response.

By a letter dated April 10, 2003, the EPA provided the final CORMIX data to the NRC (EPA 2003). The NRC can provide a copy of the data upon request. The study examined thermal plume characteristics from FCS discharges, specifically, under the 7-day 10-year low flow (7Q10) in the Missouri River. This study was performed using the EPA-approved CORMIX computer model and included intensive in river temperature monitoring. The results (EPA 2003) indicate that even under extreme low summer flow conditions and at 100 percent station power and maximum heat rejection rates, changes in the Missouri River temperature 1524 m (5000 ft) downstream of the FCS discharge will not exceed the National Pollutant Discharge Elimination System (NPDES) maximum temperature limit of 32°C (90°F) or the maximum change (ΔT) in river temperature of 2.8°C (5°F). In addition, telephone conversations with the EPA staff involved in the study have confirmed that discharges from FCS would experience overwhelming mixing and be indistinguishable from ambient river water well before the confluence of the Platte and Missouri Rivers (Dunn 2003).

The studies have demonstrated that the impact of thermal discharges from FCS on temperature regime in the Missouri River is minor. In addition, the thermal discharge from FCS would be undetectable just a few miles downstream of the station and would have no impact by the confluence of the Platte and Missouri Rivers, approximately 80.5 river km (50 river miles) downstream. The specific questions asked in your January 13, 2003, letter are addressed below.

1. How warm is the released water after it is discharged from FCS?

As discussed in the NRC's BA (NRC 2002), the maximum cooling water intake and discharge flow during FCS's normal operations occurs in summer, and amounts to approximately 23 cubic meters per second (m^3/s) (827 cubic feet per second [cfs]), or about 2 percent of the average summer river flow. At the plant's currently authorized maximum power level of 1500 megawatts-thermal (MWt), in effect since 1980, this cooling water is usually discharged at a nominal temperature of approximately 12.8°C (23°F) higher than the ambient river temperature in the summer. In the winter, this temperature differential is approximately 17.2-17.8 °C (31 – 32 °F) when a portion of the heated discharge is recirculated back to the intake structure to prevent icing (OPPD 2002). In the spring and fall when river temperatures are cool, the cooling water discharge may range approximately .6-1.7 °C (1 - 3 °F) higher than the summer nominal temperature differential of 12.8°C (23°F), and in winter the temperature differential can range several degrees higher than 17.2-17.8 °C (31 – 32 °F), reflecting the use of fewer cooling water pumps and higher efficiencies of plant heat exchangers and condensers during those times.

Several modeling and monitoring studies were conducted by the OPPD, in cooperation with others, from 1973 through 1977 to determine the characteristics of the thermal discharge from FCS (OPPD 1978). These studies were conducted prior to 1980 when the maximum authorized power level and discharge temperature of FCS was lower than present (i.e., 1420 MWt). Results from the 1973 to 1977 studies demonstrated that the Atomic Energy Commission's initial projections for the FCS thermal plume dimensions bounded conditions projected for the current FCS power level (OPPD 2002).

The maximum temperature of the FCS discharge authorized under the current NPDES permit for the plant is 43.3 °C (110° F). However, a temporary authorization of 44.4 °C (112° F) is allowed in view of unusually high ambient river temperatures that have occurred in recent years. Based on the results of the CORMIX study the EPA has suggested that the NPDES permit limits for FCS allow the current peak discharges as the permit limit (EPA 2003).

2. How far downstream does the released water travel before being fully mixed with the Missouri River in the May-July time period? Does this distance vary under high and low flow conditions?

The downstream distance that FCS cooling water travels before being fully mixed has not been directly assessed in the current CORMIX studies, which have focused on conformance to provisions of Nebraska Title 117 Chapter 1, Section 041, for mixing zones: i.e., that limited area or volume of a water body designated by NDEQ that is allowed for mixing of the discharge, upon meeting initial discharge limits. The CORMIX thermal plume modeling results using near worst case summer low flow conditions indicate that the plume temperature would fall to

approximately 1.5 °C (2.7 °F) above river ambient temperature at a point 1524 m (5000 feet) downstream, the distance assumed at the end of the mixing zone (OPPD 2003). This modeling run assumed only circulating water flow from the plant of 22.7 m^3/s (802 cfs) which is slightly lower than total discharge of 23 m^3/s (827 cfs), a discharge temperature of 13.1 °C (23.6 °F) above river ambient temperature, which approximates full power conditions and worst case summer river conditions, including a summer 7-day, 10-year low flow (7Q10) of 818 m^3/s (28,892 cfs) and an ambient river temperature of 30.6 °C (87° F). Historical thermal plume studies indicate that low river flows result in poorer mixing conditions than high river flow conditions, so predicted plume temperature at a point 1524 m (5000 feet) downstream would be lower at higher river flows (OPPD 1978, Section III, page 8).

Historical triple-depth field monitoring of the plume in August 1975 provides an example of how rapidly temperatures dissipate in the near field part of the plume during typical summer conditions. At the time those measurements were made, the plant was operating at 96 percent power level, initial discharge temperature was 9.2 °C (16.6 °F) above river ambient temperature, and river flow was 991 m^3/s (35,000 cfs). Results indicated that maximum plume temperatures were .95 °C (1.7 °F) and .78 °C (1.4 °F) above ambient temperature within 487.6 meters (1600 feet) and 1768.8 meters (5800 feet) of the discharge point, respectively (OPPD 1978, Section III, Table 18).

3. How much does the water plume warm the Missouri River in total after mixing? Does the amount of warming vary under high and low flow conditions?

Simple dilution calculations can be used to provide theoretical estimates of river temperature increases after total mixing. Assuming a cooling water discharge flow of 23 m^3/s (827 cfs) at an assumed temperature increase of 13.1 °C (23.6 °F), which approximates maximum plant power level in summer, the average river temperature would be increased by approximately .4 °C (0.7 °F) under summer low flow conditions (7Q10) of 818 m^3/s (28,892 cfs), and by approximately .1 °C (0.2 °F) under a summer maximum monthly average flow (July) of 2,224 m^3/s (78,560 cfs). However, as may be inferred from the response to Question 2 above, full mixing likely occurs within a few miles below the outfall, and heat dissipation factors other than dilution (e.g., heat loss to the atmosphere) are important in reducing plume temperature.

4. During the pallid sturgeon spawning period (May – July), how far downstream (under high and low flow conditions) is a temperature change detectable? Is it detectable at the mouth of the Platte River?

As noted above, the results of the CORMIX study have focused on near-field plume temperatures (e.g., at 1524 meters [5000 feet] downstream). However, it is expected that plume excess temperatures would be virtually indistinguishable within a few miles downstream from the outfall. For example, results of triple-depth field monitoring of the thermal plume under conditions cited above in the response to Question 2 indicate that plume excess temperatures were mostly at or below .6 °C (1 °F) within approximately 6.4 kilometers (4 miles) below the outfall (OPPD 1978, Section III, Table 18). Diurnal variations in the ambient river may be as high as 1.7 °C (3 °F), based on FCS operations logs. The mouth of the Platte River is approximately 80.5 river kilometers (RKm) (50 river miles [RM]) downstream from FCS. The FCS thermal plume is undetectable many miles upstream from the mouth of the Platte River. Therefore the staff concludes that since the thermal plume is undetectable many miles upstream of the Platte River the thermal plume from FCS would not result in inappropriate spawning cues to the pallid sturgeon.

Larval Fish Monitoring Studies

The FWS notes that, although no pallid sturgeon spawning has been documented in the Missouri River between FCS RKm 1039 (RM 646) and Gavins Point Dam at RKm 1305 (RM 811), there appears to be potential spawning habitat between Gavins Point Dam and Ponca State Park RKm 1213 (RM 753.5) (FWS 2003). The FWS further indicates that, if spawning does occur in that reach of the river, then pallid sturgeon larvae may drift as far downstream as FCS and be susceptible to entrainment. Noting that the NRC's assessment indicates that larval monitoring at FCS ended in 1977 and that the current operating license for FCS does not expire until 2013, FWS requested that the FCS larval monitoring studies be reinitiated "to verify that pallid sturgeon larvae are not being adversely affected by FCS operations" (FWS 2003).

The NRC does not believe that reinstatement of larval monitoring studies at FCS is warranted for several reasons, most of which were discussed in the NRC's Biological Assessment (NRC 2002). The following discussion highlights these reasons and provides relevant supporting information.

1. Rarity of Pallid Sturgeon near FCS

The relative rarity of pallid sturgeons in the vicinity of FCS and upstream to Gavins Point Dam is indicated by historical collections. No pallid sturgeons were reported to be collected in the extensive monitoring studies conducted by OPPD and others in the FCS vicinity in the 1970s (OPPD 1978, Hesse, Bliss, and Zuerlein 1982). Kallemeyn and Novotney (1977) collected 248 sturgeons as a result of extensive collections in 1976 at one station in the unchannelized reach below Fort Randall Dam RK 1416 (RM 880), two stations in the unchannelized reach below Gavins Point Dam, and one station in the channelized reach below Sioux City, Iowa. Only one pallid sturgeon was found in these collections, in the reach below Fort Randall Dam. All of the remainder were shovelnose sturgeons and, of these, 227 were collected in the unchannelized reach below Gavins Point. No sturgeons were collected in the channelized reach below Sioux City. This finding is consistent with the low catches of shovelnose sturgeons in the OPPD studies for FCS (OPPD 1978).

In the lower Missouri river, within which FCS is situated, more recent documented occurrences of pallid sturgeon are rare. According to the Nebraska Natural Heritage Program (NGPC 2001), between Gavins Point Dam, including its tailwaters, and Nemaha County, approximately at RKm 887 (RM 525), 32 occurrences of pallid sturgeon were documented from January 1980 through June of 2001. FCS is located at RKm 1039 (RM 646). The number of pallid sturgeon occurring upstream of FCS, according to this data source (NGPC 2001), is 15 out of the 32 occurrences with 17 out of the 32 occurrences downstream of FCS and approximately 7 out of the 32 occurrences documented at the Plattsmouth Bend. This data source (NGPC 2001) also documents an additional 8 pallid sturgeons near the confluence of the Platte and Missouri Rivers, but in the Platte River, during this same time period (i.e., from RKm 0.0 to RKm 53 [RM 0.0 to RM 33] within the Platte river). In a separate study funded by the U.S. Army Corps of Engineers (USACE) and carried out by the Nebraska Game and Parks Commission (Mestl 2003), 13 pallid sturgeons were documented in this same reach of the lower Missouri River (i.e., between RKm 1305 and Rkm 887 [RM 811 and RM 525]) during 2001-2002. The majority of these (i.e., 10 out of the 13 pallid sturgeons) were located near the Plattsmouth Bend (approximately Rkm 954-956 [RM 593-594]).

In summary the studies done by OPPD in the early 1970's documented no occurrences of pallid sturgeons in the reach of the river near FCS and the Natural Heritage Program has documented only 15 occurrences of pallid sturgeons upstream of FCS to Gavins Point Dam, in the years ranging from January 1980 through June 2001 (NGPC 2001), while NGPC documented none upstream of FCS in their independent study carried out in 2001 and 2002 (Mestl 2003).

2. Low Probability of Spawning Upstream of FCS

The rarity of juvenile and adult pallid sturgeon in the Missouri River from Gavins Point to St. Louis is indicated by recent collections that have included the lower Missouri River, in which the species has comprised only 0.2 to 0.4 percent of total river sturgeons collected (FWS 2000, page 104). Both the rarity of the species in the river and in the FCS site vicinity and upstream to Gavins Point indicates that there is a low potential production of larvae upstream from FCS. As noted above, there have been relatively more observations of this species on the Missouri River near the mouth of the Platte River, approximately 80.5 river kilometers (50 river miles) downstream from FCS.

The low potential for significant numbers of pallid sturgeon larvae to occur in the drift at FCS is supported by the low incidence of *Scaphirhynchus sp.* larvae found in intensive Missouri River fish larvae collections by OPPD and others in the vicinity of FCS in the 1970s. A review of available summary reports for that period indicate that the number of *Scaphirhynchus sp.* larvae collected in these efforts included none in 1974 and 1975, 1 in 1976, and one to a few in 1977 (OPPD 1978; OPPD 1977). Harrow and Schlesinger (1980) collected only 23 *Scaphirhynchus sp.* larvae (of a total 44,110 total larvae) in intensive vertical composite plankton net sampling at seven cross-channel transects on the Missouri River between Gavin's Point Dam and Leavenworth, Kansas. Fewer than 10 of these larvae were collected at the transect located at FCS. It is highly likely that all of these larvae were shovelnose sturgeon, which were and remain much more common than the pallid sturgeon in the Missouri River, as discussed above.

During the 1970s, documented occurrences of adult pallid sturgeons in the Missouri River per year were reduced by approximately 58% as compared to a more drastic reduction in the 1980s of 86% (55 FR 26641 [FWS 1990]). Despite the relative greater abundance of pallid sturgeons during the OPPD study period, and the subsequent higher potential for spawning to successfully occur, only a few *Scaphirhynchus* sp. larvae were found. It was not possible to identify the collected larvae below the genus *Scaphirhynchus.* Additionally, despite recent pallid sturgeon recovery efforts, evidence of successful reproduction and recruitment throughout its range remain rare. Only three pallid sturgeon larvae have been found in the lower Missouri River. Their relative number to other species of collected larvae suggest that spawning success and larval abundance for the pallid sturgeon remain low (FWS 2000). Given that pallid sturgeon occurrences upstream remain rare, despite recent habitat restoration and population augmentation efforts, and that evidence of successful spawning and larval abundance also remains very low, the NRC staff concludes that a far field larval monitoring program around FCS would not generate any useful data.

The upstream Gavins Point–Ponca reach of the Missouri River may have some potential to support spawning of the pallid sturgeon, because this unchannelized reach exhibits more natural habitat characteristics than does the river downstream, which is channelized (as at FCS). However, spawning substrate is reportedly quite limited, based on observations of Hesse and Mestl (1993) with respect to the paddlefish (*Polyodon spathula),* which spawns

demersal adhesive eggs on coarse substrates in swift current, as is presumed to be the case for the pallid sturgeon (Smith 1979, FWS 2000). In addition, as indicated by FWS in their January 13, 2003 letter (FWS 2003), no pallid sturgeon spawning has been documented in the Missouri River between FCS and Gavins Point Dam, and the specific suitability of the Gavins Point-Ponca reach for pallid sturgeon spawning has not been demonstrated.

Further, it is recognized that the hydrologic regime established under the current water control plan (CWCP) of the USACE, particularly suppression of spring flows, has likely resulted in the loss of spawning cues (i.e., warm water coupled with river stage increases) for the pallid sturgeon (FWS 2000), which would act to reduce or eliminate spawning success even if otherwise suitable spawning habitat is present. The proposed increase of river flows during spring, to produce an artificial spring rise and the potential restoration of a spawning cue for the pallid sturgeon, is one of the most contentious issues surrounding the revision of the Missouri River Master Manual. This involves a recommended additional spring flows of 425 to 566 m^3/s (15,000 to 20,000 cfs) through Gavins Point Dam during the month of May. It is unclear at this time whether such a plan will be implemented (MDNR 2003). While the critical importance of this habitat component is recognized, the magnitude, frequency, and duration of these spawning cues for the pallid sturgeon currently remain unknown, and the USACE has indicated the need for additional research, monitoring, and evaluation to determine appropriate temperature and hydrologic parameters (USACE 2003).

In summary the staff concludes that despite an intensive monitoring program in the 1970s, when the adult population was significantly more abundant, the number of *Scapirhynchus* sp. larvae caught were not sufficient to make any meaningful, and statistically valid, conclusions about the impact of the facility on the pallid sturgeon. Additional site-specific studies at this time would likely yield even less useful data.

3. Additional larval monitoring studies at FCS are unnecessary.

The NRC believes that further monitoring studies at FCS would not be useful in demonstrating whether FCS has any adverse effect on the pallid sturgeon. Monitoring studies of fish impingement and entrainment at FCS and fish populations in the Missouri River, tributary streams, and backwater habitats on and near the FCS site in the 1970s did not specifically document the presence of pallid sturgeon, and no detectable effect on Missouri River fish populations from FCS operation was discerned on the basis of these intensive studies. As noted in the Pallid Sturgeon Recovery Plan (FWS 1993) and broadly stated elsewhere, destruction and alteration of habitats by human modification of the river system are the primary cause of declines in reproduction, growth, and survival of a pallid sturgeon, and it is unlikely that the species can be recovered without restoring these habitat elements, which include morphology, hydrology, temperature regime, cover, and sediment/organic matter transport.

The NRC staff has determined, based on the known distribution of the pallid sturgeon in the Missouri River, the volume of water withdrawn by the station, the extent of the thermal plume, life history information on the pallid sturgeon and related species, and the questionable value of additional larval sturgeon collection studies in the channelized portion of the Missouri River there is no need to conduct additional larval monitoring studies at this time. While the NRC recognizes the critical importance of protecting the pallid sturgeon from possible extinction, the NRC concludes that implementing such a monitoring study is not needed nor helpful in achieving this goal and is also not needed to assess the impact of FCS's continued operations on the pallid sturgeon and protecting this endangered species. Previous OPPD studies remain relevant and supportive of NRC's conclusion that continued operations of FCS may affect, but is not likely to adversely affect the pallid sturgeon.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Nebraska Field Office
203 West Second Street
Grand Island, Nebraska 68801

July 2, 2003

Mr. Pao-Tsin Kuo
Program Director
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Mr. Kuo:

This responds to your May 30, 2003 (received June 5, 2003), letter requesting comments from the U.S. Fish and Wildlife Service (Service) on a Biological Assessment (BA) of the Potential Impacts to Threatened and Endangered Species Resulting from an Additional 20 Years of Operation of the Fort Calhoun Station (FCS), Unit 1, Nuclear Power Plant (TAC No. MB3402), located in Washington County, Nebraska. The U.S. Nuclear Regulatory Commission (NRC) submitted the BA to the Service in a letter dated December 9, 2002. The BA determined that the proposed action is not likely to adversely affect the federally listed endangered pallid sturgeon *(Scaphirhynchus albus)* or the threatened bald eagle (*Haliaeetus leucocephalus*). In addition, the BA stated that the proposed action would have no effect on the federally listed threatened western prairie fringed orchid (*Platanthera praeclara*) and piping plover (*Charadrius melodus*), or the endangered least tern (*Sterna antillarum*). After reviewing the BA, the Service concluded that additional information was required before an evaluation could be completed to determine whether the Service could concur with NRC's not likely to adversely affect determination for the pallid sturgeon. The Service requested the additional information in a letter to NRC dated January 13, 2003. NRC provided the additional information in the May 30, 2003, letter.

After reviewing the BA, and the additional information, the Service is concerned that if pallid sturgeon spawning does occur in the Missouri River between Gavins Point Dam and FCS, the larvae produced would be susceptible to entrainment or impingment at FCS. Under Section 9(a)(1) of the Endangered Species Act (ESA) of 1973, as amended, it is unlawful to "take" endangered species of fish and wildlife. As defined in the ESA, "The term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Therefore, because pallid sturgeon larvae may potentially be taken under the proposed action, the Service has concluded that it is not able to concur with NRC's not likely to adversely affect determination for the pallid sturgeon.

Since the Service is unable to concur with NRC's determination of not likely to adversely affect, we request that NRC undertake one of the following conservation measures, as part of the proposed federal action, to minimize or compensate for, project effects on the pallid sturgeon:

Measure 1: Conduct a 3-year larval monitoring study at FCS to determine the impacts of the facility on pallid sturgeon larvae. Larval monitoring studies conducted by the Omaha Public Power District (OPPD) at FCS during the 1970s found that *Scaphirhynchus sp.* larvae were being impacted by the facility. However, at that time, it was not possible to differentiate between shovelnose (*Scaphirhynchus platorynchus*) and pallid sturgeon larvae. Consequently, OPPD determined that it was highly likely that all of the collected larvae were shovelnose sturgeon, the more abundant species. Since the 1970s, advanced study techniques have evolved and researchers have developed techniques to distinguish between larvae of the two species. Therefore, the Service believes that a larval monitoring study would be instrumental in determining if the facility is taking pallid sturgeon larvae. The design of a larval monitoring study should be coordinated with the Service and Nebraska Game and Parks Commission (NGPC).

If NRC chooses this measure, the relicensing process could continue. If the larval monitoring study documents that pallid sturgeon larvae are being taken at FCS, the consultation process, under Section 7 of the ESA, would need to be reinitiated. During the consultation process, methods to minimize (e.g., structural modifications) the take of pallid sturgeon larvae at FCS would be pursued.

Measure 2: Forgo the larval monitoring study described under Measure 1, and pursue structural modifications at FCS, using the best available technology, which would either minimize or avoid the take of pallid sturgeon larvae. If NRC chooses this measure, and commits to making the structural modifications, the relicensing process could continue and the Section 7 consultation process would be completed.

If NRC chooses not to commit to either Measure 1 or 2, NRC should request initiation of formal Section 7 consultation with the Service. Under the ESA, the Service has 90 days following initiation of formal consultation during which to develop a draft biological opinion (BO), and an additional 45 days to issue a final BO. The BO would contain an incidental take statement, with reasonable and prudent measures, which the Service believes are necessary or appropriate to minimize the impacts (i.e., amount or extent) of incidental take.

In addition to the federally and state listed endangered pallid sturgeon, the sturgeon chub (*Macrhybopsis gelida*) and lake sturgeon (*Acipenser fulvescens*) are listed as endangered and threatened species, respectively, under the Nebraska Nongame and Endangered Species Conservation Act, and may be impacted by FCS. Therefore, the Service recommends that NRC consult with the NGPC regarding the possible impacts of FCS operations on state listed species. The appropriate contact person with the NGPC would be Mr. Frank Albrecht at (402)471-5422.

If you desire, the Service would be willing to participate in a conference call or attend an informal meeting (preferably at FCS) to discuss the aforementioned measures. If you or members of your staff have any questions regarding this matter, please contact Mr. Wally Jobman within our office at (308)382-6468, extension 16.

Sincerely,

Steve Anschutz
Nebraska Field Supervisor

cc: AES, R-6, MS 60120 (Attn: Bob McCue)
FWS; Bismarck, ND (Attn: Steve Krentz)
EPA; Kansas City, KS (Attn: John Dunn)
EPA; Kansas City, KS (Attn: Joe Coethern)
NGPC; Lincoln, NE (Attn: Frank Albrecht)
NDEQ; Lincoln, NE (Attn: Mike Linder)

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Appendix F

GEIS Environmental Issues Not Applicable to Fort Calhoun Station, Unit 1

Appendix F

GEIS Environmental Issues Not Applicable to Fort Calhoun Station, Unit 1

Table F-1 lists those environmental issues listed in the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS) (NRC 1996; 1999)[(a)] and 10 CFR Part 51, Subpart A, Appendix B, Table B-1 that are not applicable to Fort Calhoun Station, Unit 1 because of plant or site characteristics.

Table F-1. GEIS Environmental Issues Not Applicable to Fort Calhoun Station, Unit 1

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	Category	GEIS Sections	Comment
SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS)			
Altered salinity gradients	1	4.2.1.2.2 4.4.2.2	The Missouri River contains freshwater with no salinity gradient.
Altered thermal stratification of lakes	1	4.2.1.2.3	Fort Calhoun Station does not use a lake.
Water use conflicts (plants with cooling ponds or cooling towers using make-up water from a small river with low flow)	2	4.3.2.1	This refers to features (cooling ponds and cooling towers) that are not installed at Fort Calhoun Station.
AQUATIC ECOLOGY (FOR PLANTS WITH COOLING-TOWER-BASED HEAT DISSIPATION SYSTEMS)			
Entrainment of fish and shellfish in early life stages	1	4.2.2.1.2	This refers to a feature (cooling towers) that is not installed at Fort Calhoun Station.
Impingement of fish and shellfish	1	4.2.2.1.3	This refers to a feature (cooling towers) that is not installed at Fort Calhoun Station.
Heat shock	1	4.2.2.1.4	This refers to a feature (cooling towers) that is not installed at Fort Calhoun Station.

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

Table F-1 (contd)

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	Category	GEIS Sections	Comment
GROUND-WATER USE AND QUALITY			
Ground-water use conflicts (potable and service water, and dewatering; plants that use >100 gpm)	2	4.8.1.1 4.8.2.1	Fort Calhoun Station uses <100 gpm of groundwater.
Ground-water use conflicts (plants using cooling towers withdrawing make-up water from a small river)	2	4.8.1.4	This refers to a feature (cooling towers) not installed at Fort Calhoun Station.
Ground-water-use conflicts (Ranney wells)	2	4.8.1.4	Fort Calhoun Station does not have or use Ranney wells.
Ground-water quality degradation (Ranney wells)	1	4.8.2.2	Fort Calhoun Station does not have or use Ranney wells.
Ground-water quality degradation (saltwater intrusion)	1	4.8.2.1	Fort Calhoun Station uses <100 gpm of groundwater and is not near a saltwater body.
Ground-water quality degradation (cooling ponds in salt marshes)	1	4.8.3	This refers to a feature (cooling ponds) not installed at Fort Calhoun Station.
Ground-water quality degradation (cooling ponds at inland sites)	2	4.8.3	This refers to a feature (cooling ponds) not installed at Fort Calhoun Station.
TERRESTRIAL RESOURCES			
Cooling tower impacts on crops and ornamental vegetation	1	4.3.5.1	This refers to a feature (cooling towers) not installed at Fort Calhoun Station.
Cooling tower impacts on native plants	1	4.3.5.1	This refers to a feature (cooling towers) not installed at Fort Calhoun Station.
Bird collisions with cooling towers	1	4.3.5.2	This refers to a feature (cooling towers) not installed at Fort Calhoun Station.
Cooling pond impacts on terrestrial resources	1	4.4.4	This refers to a feature (cooling ponds) not installed at Fort Calhoun Station.

F.1 References

10 CFR Part 51. Code of Federal Regulations, Title 10*, Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

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