WOLF CREEK GENERATING STATION

ANNUAL ENVIRONMENTAL OPERATING REPORT

1985

KANSAS GAS AND ELECTRIC COMPANY

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1.0 INTRODUCTION

Kansas Gas and Electric Company (KG&E) has committed to minimizing the impact of the Wolf Creek Generating Station (WCGS) facility construction and operation on the environment. The 1985 Annual Environmental Operating Report (AEOR) is being submitted in accordance with the objectives of the Environmental Protection Plan (EPP) as required by Facility Operating License NPF-42, to demonstrate that the plant is operating in an environmentally acceptable manner.

2.0 ENVIRONMENTAL MONITORING

2.1 AQUATIC [EPP Section 2.1]

2.1.1 Impacts of Water Withdrawal on the Neosho River

WCGS has contracted with the Kansas Water Resources Board to remove 9,692,000,000 gallons per calendar year from the tailwaters of the John Redmond Reservoir. In 1985, only 571,584,651 gallons or 5.9 percent of this allotment was used. Based on monitoring studies completed by Ecological Analysts, no changes attributable to these withdrawals have been witnessed in river water quality or populations of phytoplankton, macroinvertebrates or fishes.

2.1.2 Chlorine Discharges to Wolf Creek Cooling Lake

Chlorine concentrations at the circulating water discharge structure to the cooling lake were postulated in the FES/-OLS (Section 4.2.6.1) to range between 0.68 and 1.08 mg/l total residual chlorine (TRC). These values were expected to result from three 30-minute chlorine doses per day (411 lbs. per dose) and to cause periodic, appreciable mortality among aquatic organisms. The area in which aquatic biota could be adversely affected by chlorinated effluents was conservatively estimated at 40 acres (FES/OLS Section 5.5.2.2).

Administered by the State of Kansas, the WCGS NPDES permit No. I-NE07-P002 limits circulating water TRC effluent values to a maximum of 0.2 mg/l and chlorination time to 2 hours per day. In practice, WCGS has fallen well below these allowable limits. Actual chlorine dosages have averaged about 26 lbs. per dose and daily TRC compliance has been maintained at 100%, while operating time compliance has achieved 98%. These compliance figures resulted in an average 0.1 mg/l TRC effluent value and were tabulated for the first 310 days of NPDES permit monitoring, beginning on April 24, 1985. This average TRC value equals that concentration identified in the ER/OLS (Section 5.1.3) which was expected to have no meaningful effect on the overall biological productivity of the cooling lake.

2.1.3 Cold Shock

In the event of a rapid decline in plant power level in winter, fishes attracted to the WCGS heated discharge could experience mortality due to "cold shock", a quick reduction in body temperature. In reference to licensing document evaluations, the WCGS EPP Section 2.1 (c) stated, "Cold shock effects on fish due to reactor shutdowns could cause significant mortality to aquatic species in the cooling lake". In 1985, precipitous wintertime power declines were avoided sufficiently to preclude any observable cold shock events. Re-evaluations of cold shock potential were made in light of elevated condenser delta T's experienced at both summer and wintertime water temperatures, and these summaries appear in Section 3.1 of this report.

2.1.4 Impingement and Entrainment

Impacts of impingement and entrainment were projected to be significant in the WCGS EPP, with condenser mortality for entrained organisms expected to approach 100% [ER(OLS) Section 5.1.3.3]. Because of this, sampling efforts to monitor these impacts were not required by the NRC and have not been implemented by KG&E.

2.1.5 Impacts of Wolf Creek Cooling Lake Discharges to the Neosho River

WCCL discharges into the Neosho River are regulated by WCGS NPDES permit limitations. Since discharges are sporadic, water is sampled on the first day of each discharge and weekly thereafter. Effluent parameters measured included a flow rate estimate, temperature, pH, TDS, sulfate, and chloride concentrations. Wolf Creek additions to the Neosho River are regulated to maintain a zone of passage for aquatic organisms at the confluence. Consequently, the flows allowable from Wolf Creek may range from zero to unrestricted, depending upon the similarity between Wolf Creek and Neosho River water quality and temperature, with a maximum of 90°F allowable in the Neosho River downstream of the mixing zone. In 1985, no NPDES violations at the dam (Outfall 004) were recorded. Based on monitoring studies by Ecological Analysts, there have been no apparent deleterious effects to Neosho River water quality on phytoplankton, macroinvertebrate or fish populations.

2.2 TERRESTRIAL [EPP Section 2.2]

2.2.1 Control of Vegetation in the Exclusion Zone

The composition and structure of vegetation in the 453 ha (1120 acre) exclusion zone were selectively controlled to be compatible with the function and security of station

facilities. Most areas in the immediate vicinity of the power block have been planted and maintained in a lawn-type condition. Landscaping and grass establishment have not been entirely completed to date, however all areas have been mowed at least once annually for security and aesthetic purposes. No restoration areas (areas not to be mowed) were established within the exclusion zone.

2.2.2 Vegetation Buffer Zone Surrounding Wolf Creek Cooling Lake

To create a buffer zone around WCCL, all agricultural production activities were curtailed in 1980 below elevation 1095' MSL, eight feet above WCCL normal operating surface water elevation (1087' MSL). Previously grazed or hayed native tallgrass areas were allowed to return to a natural state. Cultivated lands were allowed to advance through natural successional stages. Land management activites specified in an annual land management plan included controlled burning and native tallgrass seeding to enhance and/or maintain the designated buffer zone with a naturally occurring biotic community.

2.2.3 Herbicide Use for Maintenance of Wolf Creek Generating Station Structures

No herbicides were applied on WCGS - associated power transmission line corridors in 1985.

Herbicide was applied on the WCGS switchyard facilities on June 17, 1985. A soil sterilant consisting of 8 pounds of Karmex (EPA Reg. No. 352-247 and approved for use in Kansas) and 4 to 6 pounds of Oust (EPA Reg. No. 352-401 and approved for use in Kansas) per 100 gallons of water was applied at a rate of 20-50 gallons per acre. Application was completed by a contractor commercially licensed by the Kansas Department of Agriculture.

No noteworthy applications of herbicides were applied on other WCGS facilities during the period addressed by this report.

2.2.4 Waterfowl Disease Contingency Plan and Monitoring

A waterfowl disease contingency plan involving both state and federal personnel has been formulated to provide guidance for station biologists in the event of suspected or actual disease outbreaks. During routine wildlife monitoring and surveillance activities taking place over this reporting period, no avian mortality attributable to disease pathogens was identified.

2.2.5 Fog Monitoring Program [EPP Subsection 4.2.1]

Visibility monitoring was initiated in December 1983 and continued through 1985. The purpose of this study has been to evaluate the impact of waste heat dissipation from WCCL on fog occurrence along U.S. 75 near New Strawn, Kansas. A summary of the 1984 Visibility Monitoring Report is included in Attachment 1 of this report and the entire report is available for review at the WCGS job-site.

2.2.6 Wildlife Monitoring Program [EPP Subsection 4.2.2]

A wildlife monitoring program was initiated to monitor and assess wildlife populations or parameters most likely to be impacted by the operation of WCGS. This included a general survey program for waterfowl collision events. As outlined in the 1984/85 annual wildlife study plan, specific objectives of the wildlife monitoring program were to assess waterfowl, waterbird, and Bald Eagle usage of WCCL, to assess transmission line collision mortality of waterfowl using WCCL, to maintain a wildlife species list, and to develop an annual wildlife report. This report is summarized in Attachment 1 and is available for review in its entirety at the WCGS job-site.

2.2.7 Land Management Program [EPP Subsection 4.2.3]

Land management activities on all company-owned lands except the 453 ha (1120 acre) WCGS exclusion area were designed to achieve balances between agricultural production and conservation values. An annual management plan was formulated to address needs and propose accepted techniques for land maintenance, soil conservation, and wildlife management. These included construction or repair of livestock fences and ponds, and construction or establishment of terraces, waterways, permanent vegetative cover, and shelterbelts. The 1985 Land Management report is available for review at the WCGS job-site. A summary appears in Attachment 1 of this report.

3.0 ENVIRONMENTAL PROTECTION PLAN REPORTING REQUIREMENTS

3.1 Plant Design or Operating Changes [EPP Section 3.1]

Proposed plant design and operating changes which have the potential to affect the environment must receive an environmental evaluation prior to implementation. A summary of each Plant Modification Request (PMR) or operating change which received an environmental evaluation prior to implementation in 1985 is presented.

Evaluation 85-01 - WCGS Operation at Elevated Condenser Delta T's

Periodic loss of one of the three circulating water intake pumps for maintenance has resulted in increased heating of the reduced cooling water volume. The maximum 3 pump condenser delta T postulated in the FES(OLS) Section 4.2.6.3 was 31.5°F and delta T's at 2 pump, 100% power operation are now projected to approach 42°F. Because licensing documents predicted "significant" discharge cove cold shock mortality in the event of a midwinter plant trip and 100% entrainment mortality during routine operation, an increase in delta T should not fundamentally alter the magnitudes of these impacts. Additionally, this will not likely impinge on NPDES limitations for the temperatures of discharges into the Neosho River. Therefore, operation at elevated condenser delta T's was approved.

Evaluation 85-02 - Late Spring, Summer, and Early Fall Operation at Elevated Condenser Delta T's

The potential for cold shock in the WCGS discharge cove has been evaluated as problematic during the coldest months [FES(CP) Section 5.5.2.3]. Hence, this evaluation approved prolonged operation at elevated delta T's (>31.5°F) from late spring through early fall when WCCL fishes avoid the immediate discharge area due to higher-than-preferred temperatures.

There were no changes in station design or operation nor were there tests or experiments which involved a potentially significant unreviewed environmental question in 1985.

3.2 Non-Routine Environmental Reports [EPP Subsection 5.4.2]

3.2.1 Submitted Non-Routine Reports

No non-routine environmental reports involving significant impact were submitted to the NRC from March through December 1985. The single unusual or important environmental event evaluation completed during this period is summarized in the following section.

3.2.2 Unusual or Important Environmental Event Evaluations

May 20, 1985 Fish Kill in Construction Pond 3A

On May 17, hydrazine and ammonia was inadvertently released from the condenser to the Wolf Creek Cooling Lake through NPDES Outfall 002. The hydrazine combined with the free oxygen in the water resulted in a number of fish dying from oxygen starvation in the immediate vicinity of the outfall. The loss of these fish had little to no impact on the cooling lake and resulted in no offsite impact. Therefore it was determined that this event was not reportable pursuant to EPP Sections 4.1 and 5.4.2.

3.3 Environmental Noncompliances [EPP Subsection 5.4.1]

At WCGS in 1985, all environmental noncompliances were recorded along with the events surrounding them. The noncompliances of interest were of two types, either deviations from NPDES permit limitations or short-term fog visiometer malfunctions. These noncompliances were evaluated and determined not to be reportable pursuant to EPP Section 5.4.1. All 1985 environmental noncompliances are available for review at the WCGS job-site.

ATTACHMENT 1

SUMMARY OF

ENVIRONMENTAL INVESTIGATIONS

AT WOLF CREEK GENERATING STATION, 1985

Kansas Gas and Electric Company

Environmental Management

Burlington, Kansas

1. 1985 LAND MANAGEMENT REPORT

In keeping with annual land management plan guidelines, an annual progress report was formulated. Land maintenance items outside the exclusion zone involved stock pond and fence construction or repair. Improvement activities included native grass seeding and shelterbelt establishment. Grazing, haying, and cultivation lease control were primary mechanisms used for managing company land resources for both agricultural benefits and enhancement of wildlife, soil, and native plant resources.

2. 1985 EA, ENGINEERING, SCIENCE, AND TECHNOLOGY ENVIRONMENTAL MONITORING REPORT

Environmental monitoring performed by EA, Engineering, Science, and Technology Inc., in 1985 included those tasks done in 1984 plus bottom-to-surface dissolved oxygen profiles on WCCL and Neosho River benthic and fish community sampling. Seasonal mean concentrations of water quality parameters during 1985 were within previously established ranges for the Neosho River. Unusually high precipitation resulted in consistently elevated flows, resulting in chlorophyll concentrations and carbon fixation rates near the previously recorded minima. Similarly, highly variable river fishery and macroinvertebrate data show no long-term patterns, differences between upstream and downstream locations, or alterations attributable to plant construction and/or operation. Cooling lake water quality has been uniform among locations with dissolved and suspended constituents having shown declining trends since lake filling, indicating an improvement in overall water quality and no adverse impacts from plant operations. The WCCL macroinvertebrate population is fairly typical of midwestern reservoirs, with locational dissimilarities reflecting primarily depth and substrate differences. Operation of WCGS has caused no apparent changes in the cooling lake benthos community in 1985. Lastly, groundwater monitoring in the WCGS vicinity since 1973 indicated the well water to be very hard and to contain high levels of dissolved constituents. These observations have not altered since the filling of WCCL or since WCGS has been constructed and begun operation.

3. 1984 ECOLOGICAL ANALYSTS ENVIRONMENTAL MONITORING REPORT

Environmental monitoring completed by Ecological Analysts in 1984 included studies on the Neosho River, WCCL, and adjacent lands. Items accomplished by this study were:

1. documentation of concentrations of general water quality parameters, aquatic nutrients, organically-derived materials and certain trace metals in the Neosho River and cooling lake

2. determination of general groundwater quality in the vicinity of the facility

3. characterization of the cooling lake benthic community

4. determination of phytoplankton productivity of the Neosho River and cooling lake

5. determination of zooplankton biomass in the cooling lake

In addition to the above specific objectives, the studies documented naturally occurring variations in the aquatic communities of the Neosho River and cooling lake. Study results have shown that chemical and biological changes in WCCL have followed the trends expected for a newly impounded reservoir. Water quality and biological parameters in the Neosho River show patterns dependent primarily on John Redmond Reservoir releases.

4. 1984 PREOPERATIONAL FISHERY MONITORING REPORT

Fishery monitoring surveys were conducted on WCCL near WCGS, from April 1984 through October 1984. Collection methods employed included seining, electrofishing, otter trawling, gill and fyke netting. These resulted in the collection of 8,221 fish representing 10 families and 27 species. Data collected and data from the 1983 Fishery Report were used to describe the fishery which was subsequently evaluated based on the goal of increased plant reliability through reduced gizzard shad impingement. Plant construction during this period resulted in no observed impacts to the fishery. As in 1983, black bullheads ranked first in numbers caught, with gizzard shad and bluegills/*Lepomis* spp. following and black crappie and largemouth bass at fifth and sixth, respectively. Black bullheads also dominated biomass measurements, making up 16.3% of the total. These were followed by largemouth bass (13.6%), walleye (10.0%), common carp (9.5%), wiper (9.2%) and gizzard shad (5.7%). Relative biomass values reflected an unusually high ratio of predator fish to roughfish when compared with other midwestern reservoirs. This ratio was attributed primarily to pre-impoundment renovation and stocking efforts and high predator diversity. Average growth rates and condition ($\overline{Wr}$ or KTL) of predators (largemouth bass, wipers, and black crappie) were at or above Kansas and regional averages while walleyes were the only species examined which showed below average condition. Proportional and Relative Stock Densities (PSD and RSD) were calculated for the most important WCCL species and found to be increasing as initial year classes grow into the larger size categories. Changing predator/prey interactions were considered along with the effect of submersed macrophyte (*Potamogeton*) growth in predicting a decline in initial, rapid predator growth rates with a continuation of the observed predator dominance over gizzard shad. Data for 1985 in this area has not been completely compiled but will be reported in a supplement to this report.

5. 1984 ANNUAL VISIBILITY REPORT

Visibility monitoring was initiated in December 1983 to evaluate the impact of waste heat dissipation from WCCL on fog occurrence along U.S. Route 75 in New Strawn, Kansas. The site chosen for monitoring was considered conservative due the relatively high frequency of cooling lake-induced fog predicted to occur at this location, as well as the theoretical impact of increased fogging on traffic safety along Route 75.

Preliminary results based on data collected in 1984 during the preoperational period indicated that the frequency of natural fog at Wolf Creek was in general agreement with climatological averages of fog occurrence in the region. Fog episodes were more numerous, lasted longer, and were more intense during cooler months of the year. On a daily basis, early morning was the most favorable period for fog development. Most fog episodes were of relatively short duration, lasting an average of about 4 hours.

Visibility data will be collected through the first year of plant operations in order to quantify changes, if any, in the frequency, intensity, and duration of fog at the monitoring site. These data will be analyzed by comparison with data from the meteorological tower at Wolf Creek to determine the extent of cooling lake effects on local fogging. Data for 1985 in this area has not been completely compiled but will be reported in a supplement to this report.

6. 1984-1985 WILDLIFE MONITORING REPORT

Wildlife monitoring studies were conducted in the vicininty of WCGS from September 1984 through April 1985. Use of WCCL by wildlife was determined especially for waterfowl, waterbirds, and Bald Eagles. Bird mortality due to collisions with transmission lines traversing WCCL was assessed. With special attention to threatened and endangered species, records of all mammals, birds, and herptiles observed were maintained for comparisons to past construction and preoperational studies conducted since 1973.

A total of 145 avian species were observed during the 1984-1985 monitoring program. The most abundant species were the mallard and american coot, which comprised 34.2 and 19.2 percent respectively. Comparative use of the cooling lake and John Redmond Reservoir by waterfowl and waterbirds was determined. Of the commonly observed species, only the american coot used WCCL to a greater extent than John Redmond Reservoir. Comparative use between five cooling lake areas was determined with pondweed (Potamogeton) concentrations within WCCL generally being used to a greater degree.

Transmission line collision surveys revealed 30 mortalities representing 10 species. No mortalities of threatened or endangered species were observed. Twenty-five percent of those individuals identified were not waterbird species and were considered incidental mortalities not influenced by WCCL attraction. No significant avian mortality due to transmission line impaction was observed.

Twenty-three mammal and 16 herptile species were observed in the vicinity of WCGS during the 1984-1985 monitoring. One mammal and two reptiles were not previously documented. No threatened or endangered species were observed.

The Bald Eagle, prairie falcon and interior least tern represented the threatened or endangered bird species observed in the vicinity of WCGS. Bald Eagles were common winter residents and fed on fish and weakened waterfowl. Eagles in the vicinity of WCGS used the cooling lake solely as a feeding and loafing site, however not to the extent observed on John Redmond Reservoir. No Bald Eagles were observed roosting on WCCL. The prairie falcon and interior least tern are two species which migrate through the area and are expected to be observed occasionally in the future. Data for 1985 in this area has not been completely compiled but will be reported in a supplement to this report.

KANSAS GAS AND ELECTRIC COMPANY

GLENN L. KOESTER
VICE PRESIDENT - NUCLEAR

May 1, 1986

Mr. R. D. Martin, Regional Administrator
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

RECEIVED
MAY - 5 1986

KMLNRC 86-077
Re: Docket No. STN 50-482
Subj: Annual Environmental Operating Report

Dear Mr. Martin:

Enclosed is the Annual Environmental Operating Report which is being submitted pursuant to Wolf Creek Generating Station Facility Operating License NPF-42, Appendix B. This report covers the operation of Wolf Creek Generating Station for the period of March 11, 1985, to December 31, 1985.

Yours very truly,

Glenn L. Koester

Glenn L. Koester
Vice President - Nuclear

GLK:see

cc: PO'Connor (2)
JCummins
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