

WOLF CREEK

NUCLEAR OPERATING CORPORATION

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NA 93-0098

U. S. Nuclear Regulatory Commission
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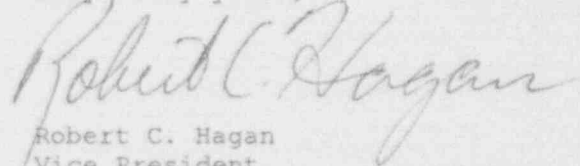
April 9, 1993

Subject: Docket No. 50-482: Annual Environmental Operating Report

Gentlemen:

Enclosed is the Annual Environmental Operating Report which is being submitted pursuant to Wolf Creek Generating Station (WCGS) Facility Operating License NPF-42, Appendix B. This report covers the operating of WCGS for the period of January 1, 1992 to December 31, 1992.

Very truly yours,


Robert C. Hagan
Vice President
Nuclear Assurance

RCH/jan

Enclosure

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Enclosure to WCNOC
Letter NA 93-0098
Dated April 9, 1993

WOLF CREEK GENERATING STATION
ANNUAL ENVIRONMENTAL OPERATING REPORT
1992

ENVIRONMENTAL MANAGEMENT SECTION
WOLF CREEK NUCLEAR OPERATING CORPORATION
P.O. BOX 411
BURLINGTON, KS 66839

APRIL 1993

WOLF CREEK NUCLEAR OPERATING CORPORATION
WOLF CREEK GENERATING STATION

1992 ANNUAL ENVIRONMENTAL OPERATING REPORT

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SUMMARY OF ENVIRONMENTAL INVESTIGATIONS AT WOLF CREEK
GENERATING STATION, 1992 ATTACHMENT

1.0 INTRODUCTION

Wolf Creek Nuclear Operating Corporation (WCNOC) has committed to minimizing the impact of Wolf Creek Generating Station (WCGS) operation on the environment. The 1992 Annual Environmental Operating Report is being submitted in accordance with the objectives of the Environmental Protection Plan (EPP) as required by Facility Operating License NPF-42. The purpose of this report is to demonstrate that the plant operated during 1992 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

The owners of WCGS have contracted with the Kansas Water Resources Board to pump 9.672 billion gallons per calendar year from the tailwaters of the John Redmond Reservoir (JRR) to Wolf Creek Cooling Lake (WCCL). During 1992, 0.484 billion gallons or 5 percent of the contracted allotment were pumped. Auxiliary raw water was pumped similar to past years at a rate of approximately 1.2 million gallons per day and comprised nearly all of the total pumped. The makeup pumps were not operated except during routine maintenance tests on September 10, 1992.

The Final Environmental Statement/Operating License Stage (FES/OLS) postulated that makeup water withdrawal of 41 cfs (average annual predicted makeup requirements) during drought conditions would extend the duration and severity of low-flow conditions below JRR. This, in turn, was expected to reduce riffle habitat which would adversely affect Neosho madtom populations, now federally listed as a threatened species. This combination of circumstances - makeup water withdrawal during very low river flows - did not occur during 1992. No impacts due to makeup pumping in 1992 were observed.

2.1.2 Chlorine Discharges to Wolf Creek Cooling Lake

Circulating Water System Discharge:

Total residual chlorine (TRC) was postulated in Section 4.2.6.1 of the FES/OLS to range between 0.68 and 1.08 mg/l at the Circulating Water System (CWS) discharge. Three 30-minute doses per day at 411 pounds of chlorine per dose were projected to produce these concentrations. These chlorine doses were expected to cause periodic, appreciable mortality among aquatic organisms in a conservatively estimated 40 acres of the discharge area of WCCL (FES/OLS, Section 5.5.2.2).

Administered by the Kansas Department of Health and Environment (KDHE), the WCGS National Pollutant Discharge Elimination System (NPDES) permit allows TRC to be a maximum of 0.2 mg/l in the circulating water effluent. Chlorine dose duration is limited to two hours per day. In practice, WCGS has kept TRC well below the NPDES allowable limits. During 1992, actual chlorine dosages to the CWS averaged approximately 87 pounds per day. Monitoring during 1992 detected a daily average TRC concentration of 0.1 mg/l. Compliance with the permit for daily maximum TRC and dose duration was 100 percent.

In Section 5.5.2.2 of the FES/OLS, the proposed chlorination treatments were not expected to meaningfully affect the overall biological productivity of WCCL. Because the actual monitored values during CWS chlorination were well below the evaluated levels and no fish mortalities attributable to chlorination were observed, permitted chlorine discharges during 1992 were not considered to have had appreciable effects on the cooling lake environment.

Essential Service Water System Discharge:

During 1992, a continuous diversion of approximately 16,000 gpm of Service Water System (SWS) flow to the Essential Service Water System (ESWS) was completed to provide microbiologically induced corrosion protection and sedimentation control. In 1989 the KDHE established a 1.0 mg/l TRC limit for the SWS flow diversion through the ESWS. Measurements of TRC averaged 0.4 mg/l and, compliance with the NPDES limit in 1992 was 100 percent. No fish mortalities or water quality changes attributable to ESWS chlorine discharges were observed during 1992.

2.1.3 Cold Shock

In the event of a rapid decline in plant power level during 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) states, "Cold shock effects on fish due to reactor shutdowns could cause significant mortality to aquatic species in the cooling lake". There were no cold shock mortality events observed during 1992.

2.1.4 Impingement and Entrainment

Impacts of entrainment and impingement were projected to be significant in the WCGS EPP. Condenser mortality for entrained organisms was expected to approach 100%. Because of this, sampling efforts to monitor entrainment impacts were not required by the NRC and have not been implemented at WCGS. Through casual observations, fish impingement at the WCCL circulating water intake was considered minimal during 1992, thus no sampling efforts to monitor impingement impacts have been initiated.

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

Cooling lake discharges into the Neosho River were regulated by NPDES permit limitations. Since discharges were sporadic, chiefly from stormwater runoff and infrequent blowdowns, water was sampled on the first day of each discharge and weekly thereafter until the end of each respective discharge. Effluent parameters measured include a flow rate estimate, temperature, pH, total dissolved solids, sulfate, and chloride concentration. Discharges of these parameters were regulated to maintain a zone of passage in the Neosho River for aquatic organisms at the Wolf Creek confluence. Consequently, the flows allowed from WCCL may range from zero to unrestricted, depending upon water quality and temperature similarities with the Neosho River. In 1992, no NPDES violations at the WCCL discharge were observed and at no time did water quality criteria restrict WCCL discharge to the Neosho River. Based on monitoring studies completed, there have been no apparent deleterious effects to Neosho River water quality or productivity due to WCCL discharges.

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. Other areas within the exclusion area have been mowed for security and aesthetic purposes.

2.2.2 Vegetation Buffer Zone Surrounding Wolf Creek Cooling Lake

To create a 500 acre buffer zone around WCCL, agricultural production activities were curtailed in 1980 below an

approximate elevation of 1095' MSL, eight feet above WCCL normal operating surface water elevation (1087' MSL). This border ranges from approximately 200 to 400 feet adjacent to the lake shoreline. Previously grazed or hayed native tallgrass areas were left undisturbed. Previously cultivated lands were allowed to advance through natural successional stages or native grass stands were reestablished. Land management activities 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

A soil sterilant was applied on selected gravel areas of WCGS. These include the Protected Area Boundary, various lay-down storage yards, meteorological tower, support building borders, storage tank berms, switchyard, hazardous waste and waste oil storage areas, and on-site railroad beds. The herbicides applied consisted of 8 pounds of Karmex (EPA Reg. No. 352-247) and 4 to 6 pounds of Oust (EPA Reg. No. 352-401) per 100 gallons of water. Application rates ranged from 20-50 gallons per acre. These herbicides are registered by the Kansas Department of Agriculture. No environmental impacts from herbicide treatment of WCGS facilities were identified.

Selected areas of problem trees and brush were cut or sprayed along the Wolf Creek/Benton 345 KV transmission lines. The cut trees were stump treated to control resprouting with Pathway (EPA Reg. No. 464-510 and 62719-31). The spray was a brush herbicide mixture which included Tordon 101 (EPA Reg. No. 464-306) and Garlon 3A (EPA Reg. No. 464-546) mixed in equal amounts to make a one percent solution in water. A wetting agent and drift inhibitor were also used. All chemicals were registered for use in Kansas. The transmission line right-of-ways were treated by a contractor commercially licensed by the Kansas Department of Agriculture. All label instructions were followed. No environmental problems were observed from herbicide treatment of these right-of-ways in the vicinity of WCGS.

2.2.4 Waterfowl Disease Contingency Plan and Monitoring

A waterfowl disease contingency plan was maintained to provide guidance for station biologists in the event of suspected or actual disease outbreaks. The contingency plan lists appropriate federal and state wildlife agency

contacts to be made by WCNOG in the event of such problems. During routine wildlife monitoring and surveillance activities taking place over this reporting period, no waterfowl 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 1987. The purpose of this study was to evaluate the impact of waste heat dissipation from WCCL on fog occurrence along U.S. 75 near New Strawn, Kansas. Upon conclusion of 1987 data collection, it was determined that sufficient information was available to evaluate cooling lake fogging and that all commitments relevant to fog monitoring had been satisfied. Because no problems were identified by these data, no formal fog monitoring program has been conducted since 1987. Through casual observations, Environmental Management personnel did not observe any incidents of man-made fog along U.S. 75 during 1992. In addition, there were no reports of such incidents from individuals or local agencies responsible for traffic safety. Implementation of mitigative actions or further monitoring was not warranted.

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. As outlined in the 1991/1992 annual wildlife study plan, specific objectives of the wildlife monitoring program were to assess waterfowl, waterbird, and bald eagle usage of WCCL. Because these annual monitoring programs target each migration season (autumn through early spring), this EPP reporting period overlaps with part of the 1992/1993 monitoring program. The objectives of this program were the same as for the 1991/1992 season. An abstract of the wildlife monitoring results is presented in the attachment to this report.

2.2.7 Land Management Program [EPP Subsection 4.2.3]

Land management activities on all company-owned lands except within 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 the construction or establishment of fences, terraces, waterways, and permanent vegetative covers. A summary of the 1992 land management activity report appears in the attachment to this report.

3.0 ENVIRONMENTAL PROTECTION PLAN REPORTING REQUIREMENTS

3.1 PLANT DESIGN OR OPERATING CHANGES

[EPP Section 3.1]

Proposed plant design and operational changes which have the potential to affect the environment must receive an environmental evaluation prior to implementation. A summary of each modification or operating change which required an environmental evaluation in 1992 is presented. There were no changes in station design or operation nor were there tests or experiments that involved an unreviewed environmental question during 1992.

Evaluation 92-1: New Use Applications for Betz C-74, Betz C-94, and Betz WCNO4 Biocide and Scale Control Treatments

This evaluation addressed the potential impacts from expanding the use of biocide and scale control chemicals at WCGS. Scale control product Betz WCNO4 had been used in the SWS and use in the CWS was to be initiated. Likewise, use of Betz C-94 as a biocide in the SWS was to be used in the CWS. Finally, use of Betz C-74 for semiannual 24 hour treatments for Corbicula control was projected. Discharge concentrations of these chemicals were expected to be similar to the previous rates which were evaluated to have no detrimental impacts. Authorization from the KDHE was requested and received prior to the use change.

Evaluation 92-2: Rip-rap Shoreline Protection North of ESWS

This evaluation covered the placement of rip-rap along the shoreline of the cooling lake north of the ESWS. This shoreline was approximately 400 feet long and protection was intended to prevent wave erosion from depositing material in the ESWS channels. Rip-rap was placed above the waterline and the total area covered much less than one acre. No environmental or permitting impacts occurred.

Evaluation 92-3: Pipe Lining of the Lime Sludge Pond Discharge

An environmental evaluation was completed on the process for lining the Lime Sludge Pond discharge pipe with a synthetic epoxy-type adhesive. Heat and styrene was to be generated and water used in the process was to be returned to the Lime Sludge Pond. This would allow the water to cool and styrene concentration to decrease. Approval was requested and received from the KDHE to handle the process by-products in this manner. No adverse environmental impacts were expected nor were any observed.

Evaluation 92-4: Grating Change on Makeup Diversion Pipe

This evaluation addressed the design change to the downstream grating on the diversion pipe through the John Redmond Reservoir dam. The grating prevented unauthorized entry by the public, but also impinged fish during use. This reduced the volume of water to the makeup pumps which divert water to the cooling lake. Grating modifications were designed to maintain flows through the pipe and prevent the makeup pumps from taking other water discharged from the dam intended to maintain Neosho River flows. An overall reduction of potential makeup water diversion impacts to the Neosho River was expected.

Evaluation 92-5: Steam Generator Ammonium Hydroxide Substitution

This evaluation involved substituting a less-pure grade of ammonium hydroxide for that previously used in the steam generators. The environmental impact of ammonium hydroxide discharges from the steam generators had been mitigated by neutralization and dilution prior to release through a monitored NPDES outfall. Substituting a less-pure grade would not change previous assessments, thus no adverse environmental impacts would occur.

Evaluation 92-6: Land Application of Domestic Sewage Sludge

This evaluation addressed the potential impacts of applying treated domestic sewage sludge from the plant's sewage treatment facility to adjacent utility owned lands. Routine disposal of the sludge in a municipal lagoon was discontinued in favor of beneficial application on primarily agricultural land. The process was proceduralized to insure compliance with regulatory requirements and commitments made to the KDHE. The application criteria were expected to prevent heavy metal and toxic organic buildup on the land. Consequently, no adverse environmental impacts were expected.

Evaluation 92-7: Wolf Creek Generating Station 4.5 Percent Power Uprate

This evaluation focused on the potential impacts from increasing the cooling water discharge temperature 2°F as a result of raising the plant's power rating by 4.5%. Emphasis was placed on potential impacts greater than evaluated in licensing environmental impact assessment which expected significant, but acceptable thermal impacts to the cooling lake biota. Thermal and aquatic monitoring studies completed since operations began showed that actual impacts have been less than the original impact expectations. The power uprate was not expected to alter the character of the lake appreciably from current operational conditions. Therefore, a significant increase from evaluated and accepted impacts in licensing documents would not occur.

Evaluation 92-8: Relocation and Upgrading of Fire Training Area

This was an environmental evaluation of an engineering design to relocate and improve the existing fire training facility at WCGS. The upgrade would include an oil/water separator and operational procedures to improve the quality of discharge waters. Containment and lining materials was expected to prevent soil and groundwater contamination. The facility was expected at the time of the evaluation to comply with NPDES permit discharge considerations. A net decrease of potential adverse environmental impacts was expected from this proposed modification.

Evaluation 92-9: Wintertime Throttling of Circulating Water Pumps to Limit Flow

This evaluation addressed the operational change of throttling the circulating water flows when ambient intake water temperature cooled below 55°F. This change would reduce the volume of water which would increase the plant's efficiency during times when cooling water was cold. A conservatively estimated rise in discharge water temperature of 13°F caused by the flow reduction was evaluated. Since this operational change would take place during winter, cold shock impacts to the cooling lake's fishery were considered. The flow reduction was not expected to increase thermal impacts significantly because the fish avoidance period was expected to increase. Also, the cool-down time following a plant shutdown would be less because of lower flows. Consequently, the temperature rise was not expected to increase cold shock impacts significantly greater than licensing evaluation expectations.

3.2 NONROUTINE ENVIRONMENTAL REPORTS

3.2.1 Submitted Nonroutine Reports

There were no nonroutine environmental reports involving significant impacts submitted to the NRC during 1992.

3.2.2 Unusual or Important Environmental Event Evaluations

No unusual or important environmental events reportable under specifications in the EPP were identified during 1992.

3.3 ENVIRONMENTAL NONCOMPLIANCES

[EPP Subsection 5.4.1]

At WCGS in 1992, nonradiological environmental noncompliances or noteworthy events were recorded along with the details surrounding them. These included such things as equipment calibration variations, a missed inspection, monitoring plan deviations, and a minor fish kill. These events were evaluated and determined not to be reportable pursuant to EPP criteria.

ATTACHMENT

SUMMARY OF

ENVIRONMENTAL INVESTIGATIONS

AT WOLF CREEK GENERATING STATION, 1992

Wolf Creek Nuclear Operating Corporation

Environmental Management

Burlington, Kansas

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1. 1992 LAND MANAGEMENT ACTIVITIES

This document presents the 1992 activities for Wolf Creek Generating Station's (WCGS) land management program. It satisfies requirements specified in Environmental Management Procedure KP-LE2206. The goals that the program was designed to and did achieve were:

- a. to maximize rent income from agricultural lands,
- b. to preserve or improve both agricultural and natural resources,
- c. to foster good relations with local agricultural and natural resource communities, and
- d. to satisfy licensing requirements.

This report focuses on how the first two goals were accomplished. The latter two were integrated into the first two and were achieved to a large degree, as by-products of them. This program satisfied sections 2.2(b) and 4.2.3 of the Environmental Protection Plan (EPP), Appendix B to the Facility Operating License.

The lands at WCGS included in this program are primarily grasslands, croplands, and woodlands which are used for various purposes depending on the location and capability of each area. The improved properties around the power block area, switchyard and plant support buildings were not included. Most are leased for grazing, haying, and crop production. A strip around the Wolf Creek Cooling Lake (WCCL) shoreline was maintained in a naturally occurring biotic community to satisfy the EPP. Others were unsuitable for agricultural production, left unused to preserve lake shoreline stability, or reserved for their wildlife value.

Resource management activities on WCGS associated grasslands included regulation of grazing pressure, seeding of native tallgrass species, fence construction, and range evaluations were accomplished. Associated management of croplands included implementation of soil conservation practices including terrace construction and farming practice requirements in respective lease contracts. Edge crops were also left for wildlife use. Control of noxious weeds was accomplished on all WCGS lands.

2. 1992 WATER QUALITY MONITORING ACTIVITIES

Water quality monitoring of the Neosho River and WCCL was conducted bimonthly during 1992 similar to past years. The program was designed to maintain comparability with baseline studies to detect potential impacts due to WCGS. No such impacts were evident in the Neosho River. As expected, changes attributed to the power plant were detected in the lake. Increased forced evaporation likely caused higher levels of dissolved salts, solids, and parameters affected by them. Temperature and dissolved oxygen profiles revealed similar results as past years excepting influence of storm-water runoff. Weak stratification occurred but at no time was it considered detrimental to the lake's fishery. The primary productivity of the lake remained consistent with levels found since lake filling, with the exception of higher productivity in the thermally influenced area. None of the operational impacts observed were considered detrimental nor were any greater than expected in initial environmental impact evaluations.

3. ASIATIC CLAM MONITORING ACTIVITIES

(Corbicula fluminea)

Distribution and densities of the Asiatic clam (Corbicula fluminea) were monitored on the Neosho River and WCCL. Flooding conditions in the river during late fall of 1992 prevented sampling at two of the five locations monitored since 1986. Upstream expansion could not be determined due to this. Densities and size distribution in the river were typical of invading populations in marginal habitat. For the first time, specimens were found in the makeup water screenhouse. The pump bays of this structure appears to provide good habitat for these clams.

Monitoring in WCCL revealed that the clams have occupied two new areas along the east shoreline likely via wave transport of juveniles. Densities were typical of young, expanding populations. Live specimens were collected from a wide range of substrate types including clay, silt, gravel, and combinations of these all of which can be found in the cooling water intake area. However, colonization into the intake area was not found. Neither were planktonic juveniles found in the lake water upstream of the circulating water screenhouse. Based on the monitoring results, in-plant systems do not appear to be immediately threatened with Corbicula encroachment. Expansion into more areas, including the intake area, of the lake is expected to occur likely through wave action within the next year or two.

4. 1992 FISHERY MONITORING ACTIVITIES

Fishery monitoring surveys were conducted on WCCL from April through October 1992. Collection methods used to target species of concern were fyke netting, seining, electrofishing, and gill netting. Data collected were used to describe the fishery which was subsequently evaluated based on the goal of increased plant reliability through reduced gizzard shad impingement.

Monitoring of WCCL in 1992 revealed that the annual gizzard shad production continued to be cropped, preventing impingement problems at the plant's cooling water intake structure. The predator populations showed signs of being prey limited, which included low recruitment, below normal body condition, and slow growth. However, not all species demonstrated these characteristics simultaneously and most have appeared to develop stable populations capable of long term sustainability. The wiper hybrid, a nonreproducing predator, continued to age and may require a support stocking in 1994 to maintain them. In summary, the fishery in WCCL has consumed the annual gizzard shad production greatly reducing impingement potential and should continue to do so in the future.

5. WILDLIFE MONITORING ACTIVITIES

The wildlife monitoring activities targeted possible impacts from station operation to migratory and wintering water birds in the vicinity of WCGS. The results presented here cover the 1991/1992 winter monitoring season and the first half of the 1992/1993 season. The general objectives of the program were to document and assess any trends or impacts to migrating or wintering populations of waterbirds, waterfowl, and threatened or endangered species that may be caused by station operation. Use of WCCL may expose birds to transmission line collision mortality or to disease outbreaks. Damage to local agricultural crops by large waterfowl concentrations using WCCL was also a concern. To document and assess such occurrences or increased potential for such, specific objectives of the program were to monitor how many and where waterbirds, waterfowl, and threatened and endangered species used WCCL during the winter migration season and compare these to the norm observed since station operation began.

During the 1991/1992 season thirty-four species of waterbirds and waterfowl were observed with Franklin's gull and snow goose being most abundant. Mallard usage was down from previous years' totals. During the fall of 1992, similar usage was observed. During operational winters, the heated effluent provided previously unavailable open water habitat on WCCL. This, in combination with seclusion and close, abundant food supplies, has usually kept wintering birds on WCCL longer than during preoperational seasons. Significant ($p \leq 0.05$) preferences for areas of WCCL providing these factors were found during most operational seasons, although this was not the case during the 1991/1992 season. No disease or crop depredation problems were observed. No significant transmission line collision events nor the increased potential for such were observed.

The bald eagle was the only threatened or endangered species that was consistently observed using WCCL. Its usage on WCCL declined during the first two years after plant operation began while remaining constant on John

Redmond Reservoir (JRR). A large increase was observed during the next two winters. A marked decline on both reservoirs was observed during 1989/1990 with only a very slight recovery observed during the 1990/1991 winter. During the fall of 1991, eagle numbers reflected usage experienced during the same time periods of earlier monitoring. Eagle usage during the 1991/1992 winter was lower than any previous operational winter. Eagle usage continued to decrease during the fall of 1992. Initial operational usage on WCCL declined primarily because of the two mild winters which caused gizzard shad, a vulnerable and preferred food resource, to be more available on JRR than WCCL. The winters of 1987/1988 and 1988/1989 were colder and station operation enhanced usage. This provided winter killed gizzard shad not usually abundant on WCCL. During the 1990/1991 and 1991/1992 monitoring seasons, bald eagle usage of WCCL reflected patterns identified for mild winters. With regression analysis it was shown that since the addition of heated effluents, the colder the air temperatures were, the greater the percentages were of area birds using WCCL. No incidence of bald eagle collisions with WCGS transmission lines have been found as a result of the usage patterns observed.