KANSAS GAS AND ELECTRIC COMPANY

GLENN L. KOESTER
VICE PRESIDENT - NUCLEAR

September 17, 1982

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

KMLNRC 82-242
Re: Docket No. STN 50-482
Ref: NUREG-0881, Wolf Creek Safety Evaluation Report

Dear Mr. Denton:

Transmitted herewith is a revised response to NRC Question 241.15WC. The purpose of this revised response is to provide information needed to resolve Confirmatory Item A-2 (Main Dam Seepage) identified in the Referenced document. This information will be formally incorporated into the Wolf Creek Generating Station, Unit No. 1, Final Safety Analysis Report in Revision 10. This information is hereby incorporated into the Wolf Creek Generating Station, Unit No. 1, Operating License Application.

Yours very truly,

Glenn L Koester

GLK:es
Attach

B001

cc: Mr. J. B. Hopkins (2)

Mr. Thomas Vandel

201 N. Market — Wichita, Kansas — Mail Address: P.O. Box 208 / Wichita, Kansas 67201 — Telephone: Area Code (316) 261-6451

OATH OF AFFIRMATION

STATE OF KANSAS)
) SS:
COUNTY OF SEDGWICK)

I, Glenn L. Koester, of lawful age, being duly sworn upon oath, do depose, state and affirm that I am Vice President - Nuclear of Kansas Gas and Electric Company, Wichita, Kansas, that I have signed the foregoing letter of transmittal, know the contents thereof, and that all statements contained therein are true.

KANSAS GAS AND ELECTRIC COMPANY

ATTEST:

By Glenn L Koester
Glenn L. Koester
Vice President - Nuclear

W. B. Walker, Secretary

STATE OF KANSAS)
) SS:
COUNTY OF SEDGWICK)

BE IT REMEMBERED that on this 17th day of September, 1982, before me, Evelyn L. Fry, a Notary, personally appeared Glenn L. Koester, Vice President - Nuclear of Kansas Gas and Electric Company, Wichita, Kansas, who is personally known to me and who executed the foregoing instrument, and he duly acknowledged the execution of the same for and on behalf of and as the act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal the date and year above written.

EVELYN L. FRY NOTARY PUBLIC

Evelyn L. Fry
Evelyn L. Fry, Notary

My Commission expires on August 15, 1984.

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lateral movements, however, the movements recorded are considered within the expected range. These movements are primarily the results of the non-symmetrical softening of the embankment that takes place during the filling of the reservoir. Very little data on lateral movements of dam embankments taking place during reservoir filling are available. This is particularly the case for embankments less than 100 feet high such as the Main Dam Embankment at Wolf Creek; however, data from dams ranging in height from 250 to 700 feet high show lateral movements between 10 and 20 inches (Kjaernsli and Torblaa, 1968; Nobari and Duncan, 1972; Marsal, 1959).

The maximum settlement recorded to date is on the order of four inches and was observed within the closure section. Settlements outside the closure section range from 0 to 2 inches. It is felt that the higher settlements recorded within the closure section reflect its shorter construction period, thereby not allowing time for completion of the construction related settlements prior to installation of the settlement monitoring monuments. Also, the embankment outside the closure section was nearly completed 6 to 12 months before construction started on the closure section. The recorded settlements represent less than 1/2 of 1 percent of the embankment height. Based on reports on settlements of earth dams (Kjaernsli and Torblaa, 1968; Nobari and Duncan, 1972; Marsal, 1959) settlements up to one percent of the embankment are considered normal and acceptable.

Data collected to date on the observed seepage on the downstream toe of the Main Dam at Station 58+50 are presented in Table 241.15-6. Data on the cooling lake elevations on the date of each seepage observation are also shown on this table. The location of the seepage observations is shown on Figure 241.15-2. The seepage observations made to date

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have generally been made by visual inspection and, therefore, do not represent precise quantitative data. The data are considered to represent reasonable approximations of the actual seepage rates, however. More accurate quantitative data will be obtained after construction of the temporary weir described in the response to part 2 of Question 241.15.

The observed seepage rate data collected to date indicate a wide range of flow rates ranging from 5 milliliters per second (ml/sec) to 1500 ml/sec. The majority of the observations, however, indicate seepage flow rates of less than 100 ml/sec. The higher flow rates which occasionally occur appear to be related to periods of precipitation which occurred prior to observation dates, and are not considered to represent increases in seepage of water from the cooling lake through the Main Dam embankment, but rather infiltration through the toe drain. This is supported by the fact that peaks in the observed seepage rates are always followed by a return to a substantially lower rate on later observations. In order to illustrate the relationship between precipitation and fluctuations in the observed seepage flow rates, the two sets of data are graphically compared on Figure 241.15-3. This figure represents the period through December 1981 for which digitized precipitation data are available from the onsite meteorological monitoring system. Although digitized precipitation data are not available for 1982, inspection reports indicate that rain runoff contributed to the occasional peak flow rates observed in 1982.

The data collected to date indicates that observed seepage is well within the seepage rates previously estimated for the Main Dam. Based on the permeability values of the materials used in the construction of the Main Dam embankment, a seepage rate of 0.6×10^{-5} cubic feet per second (.16992 ml/sec) per foot of Main

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Dam was computed in Section 2.5.6.6.1. For the entire length of the Main Dam this corresponds to a seepage rate of 0.0734 cfs (Section 3.2.2.3.6 of Sargent & Lundy report SL-3830, "Engineering Data Compilation for Wolf Creek Lake"), which is equivalent to 2078 ml/sec. However, since the observed seepage at Station 58+50 likely represents the seepage through only a portion of the Main Dam, the seepage would be expected to be less than 2078 ml/sec. If it is conservatively assumed that seepage at Station 58+50 represents seepage through only a 3,000 foot length of the Main Dam, seepage would be expected to be 3,000 feet x .16992 ml/sec/ft or approximately 510 ml/sec. Except for the occasional peak flow rates, which are attributed to site precipitation, the observed seepage rates at Station 58+50 are, therefore, well within the amounts which are reasonably expected. During all inspections the seepage water was observed to be clear and free of suspended soil particles, even during peak flows.

REFERENCES

Kjaernsli, B., and Torblaa, I., (1968), Leakage Through Horizontal Cracks in the Core of Hyttejuvet Dams: The Norwegian Geotechnical Institute Publication No. 80, Oslo, Norway.

TABLE 241.15-6 (Sheet 1 of 2)

OBSERVED SEEPAGE RATES
MAIN DAM STATION 58+50

Inspection Date	Observed Seepage Rate (ml/sec)	Cooling Lake Elevation (feet)
4-24-81	40	-
4-30-81	20	-
5-08-81	18	-
5-15-81	30	1958.9
5-21-81	200	-
5-29-81	100	1960.7
6-04-81	80	1961.3
6-12-81	80	1962.8
6-19-81	150	1963.7
6-24-81	125	1964.6
7-02-81	125	1965.6
7-09-81	20	1966.6
7-17-81	20	1967.0
7-24-81	15	1968.3
7-30-81	10	1969.2
8-06-81	5	1970.0
8-14-81	30	1970.8
8-21-81	5	1970.8
8-28-81	15	1971.0
9-03-81	100	1972.0
9-10-81	95	1972.5
9-16-81	75	1973.4
9-24-81	75	1974.1
10-02-81	50	1974.5
10-08-81	50	1975.3
10-16-81	400	1976.1
10-23-81	110	1976.8
10-29-81	50	1977.2

NOTES:

1. Elevations refer to SNUPPS reference datum.
2. Observed seepage rates for 1981 are plotted on Figure 241.15-3.
3. Seepage observations were made on downstream toe of Main Dam at Station 58+50. Location is shown on Figure 241.15-2.
4. Unobservable due to ice cover.

TABLE 241.15-6 (Sheet 2 of 2)

Inspection Date	Observed Seepage Rate (ml/sec)	Cooling Lake Elevation (feet)
11-06-81	500	1977.9
11-12-81	50	1978.7
11-19-81	10	1979.2
11-25-81	10	1979.3
12-03-81	40	1979.5
12-10-81	50	1979.5
12-18-81	10	1979.5
12-23-81	10	1979.5
12-31-81	10	1979.5
1-08-82	(See Note 4)	1979.5
1-15-82	(See Note 4)	1979.5
1-22-82	(See Note 4)	1979.5
1-28-82	(See Note 4)	1979.5
2-04-82	(See Note 4)	1980.3
2-12-82	100	1980.3
2-18-82	1000	1980.4
3-05-82	40	1980.4
3-11-82	40	1980.6
3-18-82	1500	1980.8
3-25-82	85	1980.9
4-02-82	40	1981.0
4-08-82	20	1981.3
4-16-82	10	1982.0
4-23-82	10	1982.4
4-29-82	20	1982.7
5-06-82	250	1983.6
5-14-82	250	1984.8
5-20-82	200	1985.9
6-02-82	1500	1987.5
6-11-82	800	1987.6
6-18-82	250	1987.6
6-25-82	1500	1987.4
7-02-82	100	1987.5
7-09-82	25	1987.5
7-19-82	300	1988.0

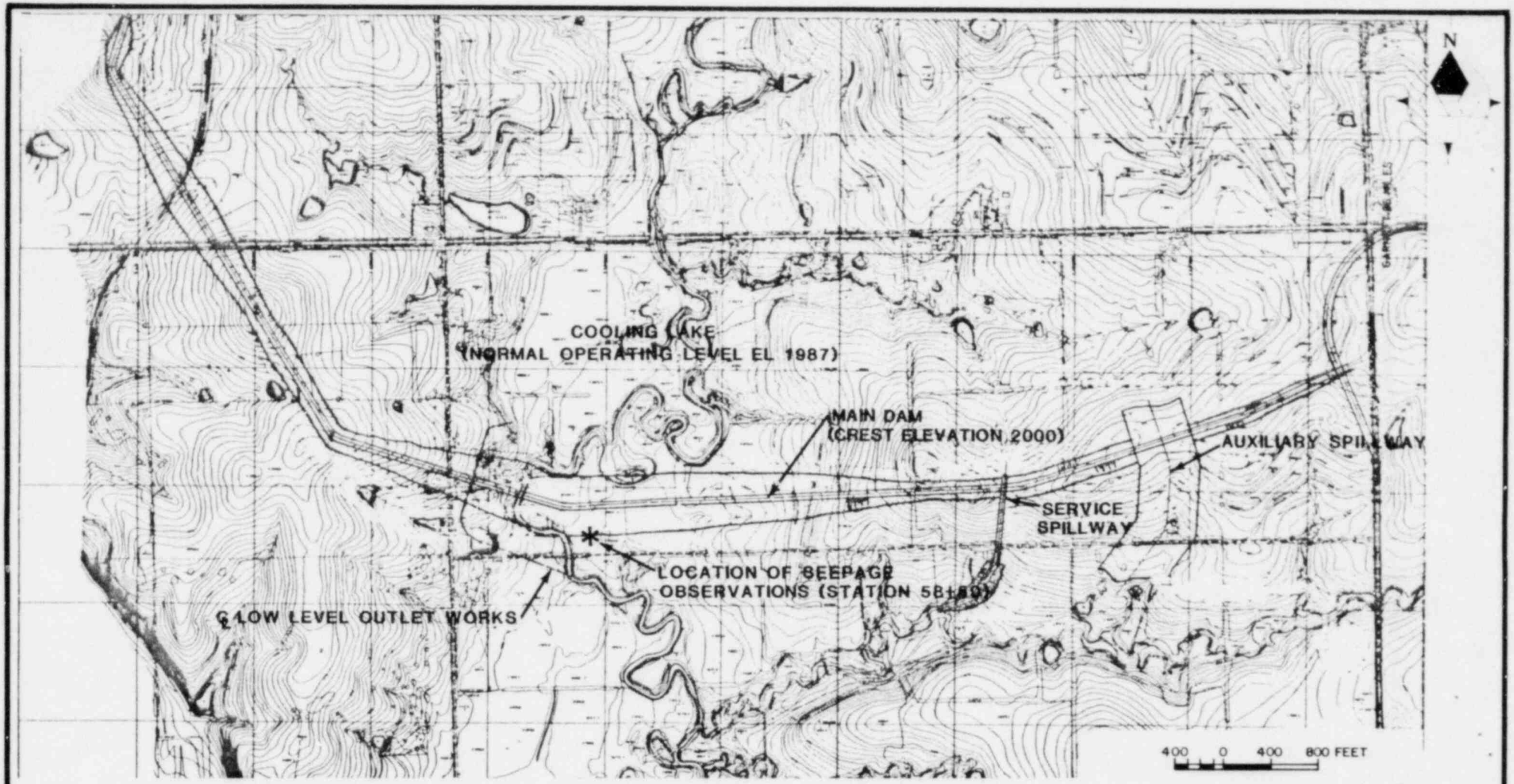

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FIGURE 241.15-2

LOCATION OF SEEPAGE OBSERVATIONS AT MAIN DAM

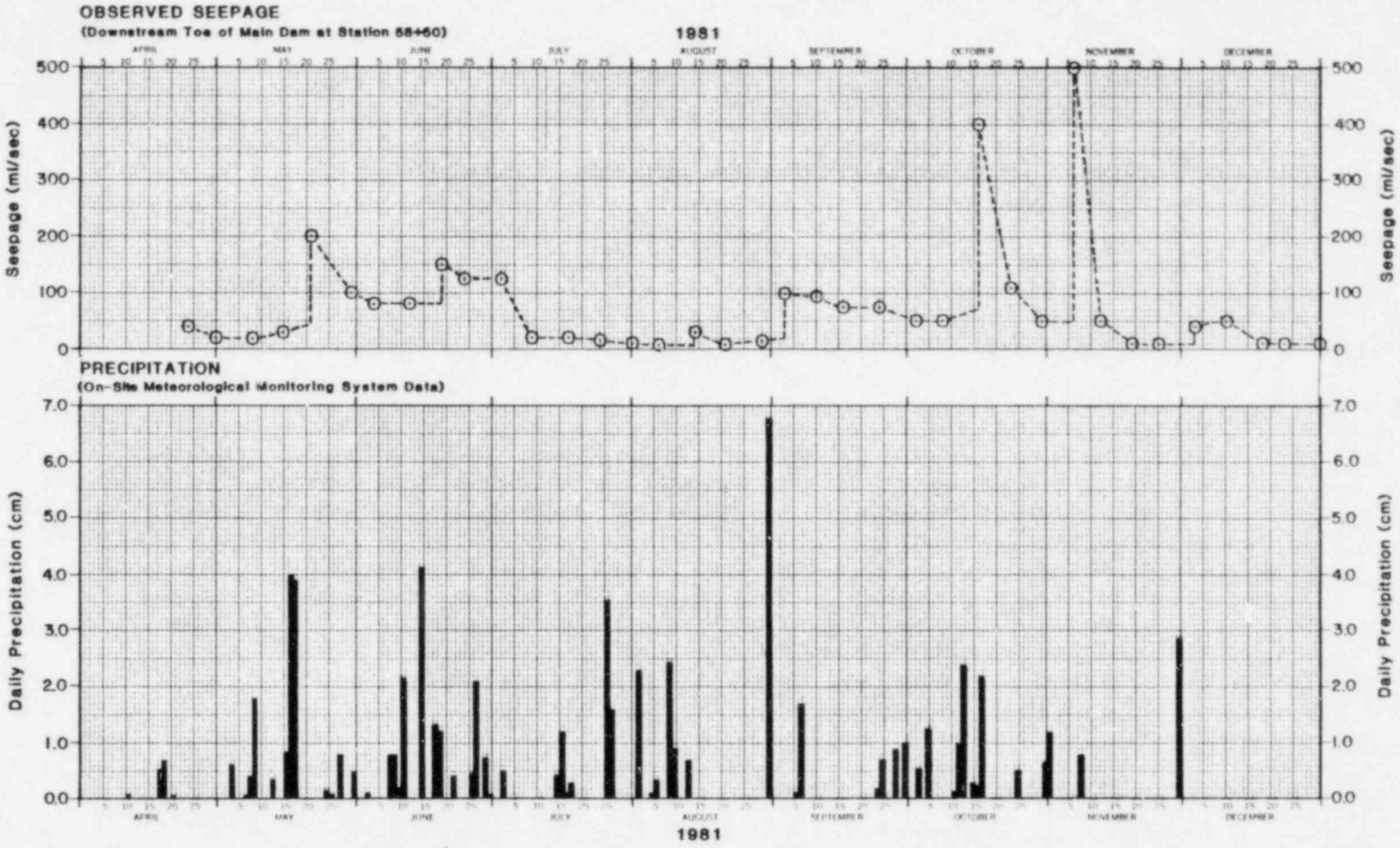

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FIGURE 241.15-3 OBSERVED SEEPAGE AND PRECIPITATION DATA