

TEXAS UTILITIES GENERATING COMPANY

2001 BRYAN TOWER - DALLAS, TEXAS 75201

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File 10015

R. J. GARY
EXECUTIVE VICE PRESIDENT
AND GENERAL MANAGER

December 22, 1980

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
DOCKET NOS. 50-445 AND 50-446
RESPONSE TO NOVEMBER 14, 1980 REQUEST
FOR CLARIFICATION WITH RESPECT TO
ENVIRONMENTAL REVIEW

Dear Mr. Denton:

By Mr. Robert L. Tedesco's letter dated November 14, 1980, Texas Utilities Generating Company was asked to formally clarify certain of their September 12, 1980 responses to the NRC Staff's request for additional information. Attached is our response to items 1, 2, 3, and 4 of the enclosure to Mr. Tedesco's letter.

As stated in the attachment to this letter, the special data requested by item 4 was forwarded to the Environmental Review Coordinator, Mr. John Lehr, by letter dated December 4, 1980. The information with respect to items 1, 2, and 3 above is included in the attachment to this letter and Amendment 2 to the Comanche Peak Environmental Report. This formal Amendment is forwarded this date by separate cover.

If you have any questions concerning the above, please let us know.

Respectfully submitted,

R. J. Gary
R. J. Gary

RJG:skf
Attachment
cc: John Lehr

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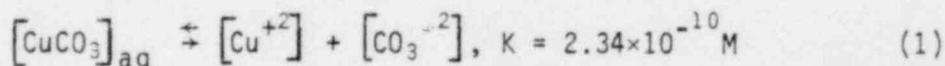
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1. It has been estimated that copper will leave the Comanche Peak condensers at a rate of 3.29×10^7 gm/yr over the first month of operation, and then at the rate of 3.29×10^6 gm/yr thereafter. The copper going into solution will be in the form of elemental copper, Cu^{+2} , and copper oxide, CuO .

In lakes, copper in solution is in (1) ionic form (Cu^{+2}); (2) complexed in organic materials; (3) absorbed and precipitated on solids; and (4) incorporated in other crystalline structures. Most copper is tied up in the crystalline structure of sedimentary materials, less is in organic complexes and dead seston, and very little is in solution. In natural waters, the concentration of Cu^{+2} ranges from 1 to 50 $\mu\text{g/l}$ ¹. The ionic form, Cu^{+2} , has a biomagnification factor of about 30 - 60×10^3 and is the form of copper most related to aquatic life toxicity².

The copper entering the lake with the cooling water will rapidly reach equilibrium with a complex chemical species leaving little in solution as toxic ionic copper. The amount can be quantified once the ionic equilibrium is identified and then perturbed by the rates of loss at the condenser. Pagenkopf³, among others, suggests that the low copper concentrations in water can be described by a carbonate equilibrium of:



where CO_3^{-2} represents the carbonate balance. Carbonate con-

centrations in natural waters range from 50 mg/l to 150 mg/l (8.3×10^{-4} to 2.5×10^{-3} M).

The above equilibrium is perturbed by the Cu^{+2} addition. If C_1 is the total addition in a year, and x is the amount that ends up as Cu^{+2} in solution with $(C_1 - x)$ added to the $[\text{CuCO}_3]_{\text{aq}}$ sink, then the new equilibrium is:

$$\frac{[\text{Cu}^{+2} + x] [\text{CO}_3^{-2}]}{[\text{CuCO}_3 + (C_1 - x)]} = K \quad (2)$$

Using Equation (1) for the natural equilibrium, the increase in Cu^{+2} per addition C_1 is:

$$x/C_1 = \frac{K}{[\text{CO}_3^{-2} + K]} \quad (3)$$

which is controlled by the carbonate balance. The amount of copper remaining in solution is, therefore, 2.7×10^{-7} times the amount added.

After the first month, there is 3.29×10^6 gm/yr added to 140,000 Acre-Ft. ($1.72 \times 10^8 \text{ m}^3$) of lake. It is assumed that over a year, the added copper will go into solution uniformly throughout the lake due to plant pumping; uptake, settling, decay and resolution by organic material; and, general lake seasonal circulation. The addition, C_1 , over the lake volume is equivalent to a concentration addition of 0.20 mg/l per year. The addition to Cu^{+2} in solution becomes, from Equation (3), 0.54×10^{-7} mg/l per year, or 0.54×10^{-4} $\mu\text{g/l}$ per year. Even over a large number of years, this is an insignificant addition to natural background levels of 1 to 50 $\mu\text{g/l}$.

2. The Applicant is concerned about the accuracy of projecting an estimate of sludge production during operation, based upon construction-phase operation of the waste treatment system. During the construction phase, larger volumes of waste are generated and operating techniques and philosophies may differ; therefore, using construction phase sludge production to project operational phase sludge production is not the best method.

The Applicant, after discussion with the wastewater treatment facility's manufacturing representative, projects the following:

In operating the 30,000 gallon per day Extended Aeration Process system, the maximum amount of sludge anticipated would be 2200 gallons per quarter with a solids concentration of 10,000 to 30,000 mg/liter. This amount and the frequency of sludge removal will vary depending upon the number of people on site and day to day operating techniques. During the operational phase, when sludge removal is required, the Applicant will contract with an approved commercial firm to remove this sludge and dispose it at a permitted disposal area.

3. The source of use of the following chemicals from Amended Table 3.6-1 are listed below:

<u>CHEMICALS</u>	<u>SOURCE OF USE</u>
Sodium hexametaphosphate	Reverse osmosis system
* Polymer	Water Clarifier
Formaldehyde	Reverse Osmosis System
**Powdex resin (styrene-divinylbenzene) polymer	Condensate polishers

* This is a proprietary chemical supplied by Nalco as their product No. 8101. Information concerning its chemical composition is unavailable.

**This is supplied by Ecodyne-Graver and is a styrene divinylbenzene polymer.

4. A copy of a "Dead Fish Survey" conducted by Texas Power and Light from January 1976 through June 1978 was forwarded to the Environmental Review Coordinator, Mr. John Lehr, by letter dated December 4, 1980. The subject survey was conducted by plant operating personnel. Impinged ("dead") fish were removed from the travelling screens as the screens were rotated once every eight hours. The fish were counted or if the number was over 100 they were estimated. The DeCordova S.E.S. circulating water pumps have a total capacity of 452,000 gpm. The intake area has a design velocity of 1.5 fps.

The Applicant is pleased to provide this data, but doubts its usefulness in estimating the impact of the CPSES intake on Squaw Creek Reservoir. First, the Lake Granbury data is not statistically meaningful because there is no corresponding fish population data. Second, the differences in several limnological parameters, including shoreline length, average depth and morphology limit the usefulness of the subject data in predicting potential impingement impacts at Squaw Creek Reservoir.

References

- ¹| Wetzel, R.G., Limnology, W.B. Saunders Co. Phila., 1975, pages 263-265.
- ²| EPA, Quality Criteria for Water, Environmental Protection Agency, Washington, DC, July 1976, pages 54-64.
- ³| Pagenkopf, G.K., Introduction to Natural Water Chemistry, Marcel Dekker, Inc., New York, pages 197-200.