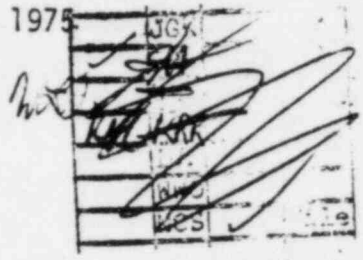
INSPECTION AND ENFORCEMENT 40-8027

Ken – This is IE II's sent it? Yes

KERR-McGEE NUCLEAR CORPORATION

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

December 8, 1975



Send to Region IV

William Crow, Acting Director
Materials Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Crow:

Please refer to our request of August 13 for an amendment to Source Material License SUB-1010 to allow the unlimited use of treatment solvent extraction raffinate as fertilizer solution. Since the submission of this request, we have found an additional possible commercial use for this waste material.

Arkansas Kraft Corporation, manufacturer of Kraft Paper, located at Morrilton, Arkansas, as part of their treatment process stores a waste liquor in a large pond where the pollutant materials are consumed by bacteria. During the cold months of the year, a fertilizer solution is added to the waste solution flowing into the pond in order to provide a nutrient for the bacteria. Ark-Kraft has notified Kerr-McGee Nuclear Corporation that they would be willing to substitute our treated raffinate as a source of this nutrient as a test during the coming winter months.

In view of this interest, we propose that our License SUB-1010 be amended to permit the test disposal of up to 4,000 gal/da of 8% ammonium nitrate solution containing not more than 3 pCi/l of radium-226 (.1 pCi/gm N) to Arkansas Kraft Corporation for the purpose of providing nutrient solution for waste treatment ponds until 5/31/76. A description of the test in support of this request for amendment is attached.

If you require additional or more detailed information, please let us know. Your prompt approval of this request would permit more extensive test periods through the coming cold weather.

Very truly yours,

W. J. Shelley, Director
Regulation and Control

WJS:ml

Attachment

cc: R. B. Chitwood

2663

78 III

ATTACHMENT

Supporting data for Amendment to Source Material License SUB-1010 to permit the disposal of barium treated solvent extraction raffinate to Arkansas Kraft Corporation as a test of its nutrient values for the treatment of Kraft Paper waste liquors.

Introduction

Kerr-McGee Nuclear Corporation has experimented with the treatment of the liquid waste solution from the solvent extraction process by the addition of soluble barium salts to precipitate the radium as barium-radium sulfate complex. Work on this system commenced in 1972 and since 1973 has been used during each growing season by distributing to a grassed graded area immediately in front of the facility. From the data generated thus far, Kerr-McGee believes that the treated raffinate consisting of an 8% solution of ammonium nitrate constitutes a beneficial source of ammonium nitrate available for use wherever the nutrient value provides a benefit.

Proposal

Kerr-McGee Nuclear Corporation proposed on August 13, 1975, that barium treated solvent extraction raffinate be considered a nutrient ammonium nitrate solution available for disposal through a number of possible commercial routes.

It has since come to our attention that the Kraft Paper Industry consumes ammonium nitrate as a nutrient for treatment of waste liquors generated in the process. Arkansas Kraft Corporation of Morrilton, Arkansas, has shown in Exhibit 1 their willingness to test this raffinate as a nutrient source for their mill waste treatment system. Kerr-McGee therefore proposes that License SUB-1010 be amended to permit the test use of barium treated solvent extraction raffinate containing not more than 3 pCi/l (.1 pCi/gm N) as a nutrient treatment in this waste treatment system until 5/31/76.

Disposal System

Arkansas Kraft Corporation consumes approximately 900 lbs. of available nitrogen per day as a nutrient material for the bacteria consuming the pollutants from a waste liquor stream produced in the manufacture of Kraft Paper. Currently, this available nitrogen is provided by the use of a 32% N solution purchased commercially at a cost of $105 per gross ton, $ .164 per pound of available nitrogen. This liquid nutrient is combined with a waste steam of 200,000 gal/min. flowing into a 78×10^6 gal/da. The outfall from the basin is sampled three days each week with a 24-hour continuous sampler.

With the approval of this proposed amendment, Kerr-McGee would supply to Ark-Kraft approximately 4,000 gal/da. of 8% ammonium nitrate solution. A typical analysis is shown on Exhibit 2. The radium content of this solution would be 3 pCi/l (.1 pCi/gm N) or less.

The material would be shipped Arkansas Kraft Corporation in an over-the-road tank trailer and pumped into the current treating system.

Control

Kerr-McGee Nuclear Corporation would analyze each truckload of treated raffinate supplied to Ark-Kraft for metallic ions and nitrogen and radium content. An aliquot of the tri-weekly sample from the Ark-Kraft sampling activity would be analyzed for radium-226. In this manner, at the end of the test period, a definitive statement could be made as to the disposal of the radium-226 contained in the nutrient solution.

Impact on the Environment

A description of the radium-226 added to the environment by the use of treated raffinate is given in the request for amendment dated August 13, 1975. At a rate of 4,000 gal/da. of available nitrogen, approximately .045 µCi/da. would

be added to the Ark-Kraft treating pond. A concentration of Ra-226 of approximately 2×10^{-3} pCi/l would be measured in the outfall from the Ark-Kraft treatment pond if none was absorbed by the bacteria growing in the pond. This amount is considerably less than any current EPA effluent limitation and is approximately .04% of the proposed drinking water standards.

Cost Benefit

a. Arkansas Kraft Corporation would replace expensive nutrient solution for waste treatment costing approximately $ .164/lb. nitrogen with a waste solution costing approximately $210/truckload for transportation ($ .102/lb. N) for a net gain to the economics of their operation of $55.80/da.

   An objective of the Environmental Protection Association has been realized wherein the waste material from one operation is consumed as a beneficial reagent in another operation.

b. Cost

   The use of barium treated raffinate as nutrient solution for the treatment of Kraft Paper Mill waste would not result in any significant cost to the environment.

Conclusion

Based upon the discussion above, Kerr-McGee believes that the benefits available through the use of barium treated raffinate as a nutrient solution for the treatment of Kraft Paper Mill waste liquors far outweigh any measurable cost penalty to the environment and that this method of disposal should be therefore authorized.

Exhibit 1

Arkansas Kraft Corporation

P. O. BOX 711, MORRILTON, ARKANSAS 72110
AREA CODE 501 – 354-4521

October 30, 1975

Mr. J. W. Craig, Manager
Conversion Engineering
Kerr-McGee Nuclear Corporation
P.O. Box 267
Gore, Oklahoma 74435

Dear Jim:

This letter is to inform you that Arkansas Kraft Corporation has no objections to the utilization of your ammonium nitrate rich waste material as a nutrient source for the mill waste treatment system. This acceptance is, of course, contingent upon satisfactory cost arrangement, the ability to limit (or discontinue) usage should it be necessary, and of course continued agreement and acceptance of the material as a nutrient by the various regulatory agencies.

Please advise if further information is needed.

Yours very truly,

ARKANSAS KRAFT CORPORATION

George F. Wade

George F. Wade
Technical Superintendent

GFW/cw

c: V. P. and Mill Manager
Manager of Environmental Services
file (2)

Exhibit 2

TREATED RAFFINATE ANALYSIS

	Pond #1	Pond #2	Fresh Raffinate	Max. Fresh Raffinate
Sp. Gr @ 25°C	1.052	1.086	--	--
NO_3 (N_2) gm/l	77.9 (17.6)	139.1 (31.4)	84.1 (19)	(19)
NH_4 (N_2)	11.6 (9.0)	34.1 (26.5)	19.3 (15)	24.4 (19)
Ca	8.5	2.1	0.81	4.0
SO_4	2.7	12.0	13.5	33
Na	2.7	5.7	7.2	53
Mg	0.4	1.0	N.A.	0.8
Cl	0.16	0.37	0.45	2.1
K	0.3	0.5	0.2	0.9
Mo	0.09	0.17	0.3	0.6
Cu	0.003	0.004	--	--
Fe	--	--	1.5	3.3