



UNITED STATES
ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS
REGION IV
10395 WEST COLFAX, ROOM 200
DENVER, COLORADO 80215

E. Smith -
Action PLS

June 18, 1974

H. D. Thornburg, Chief
Field Support and Enforcement
Directorate of Regulatory Operations, HQ

KERR-MCGEE SEQUOYAH UF_6 PLANT, GORE, OKLAHOMA
RETENTION POND LEAKAGE

During our June 4-6, 1974, routine inspection of the Kerr McGee Nuclear Corporation Sequoyah Uranium Hexafluoride plant (License No. SUB-1010), apparent seepage from the licensee's Raffinate Storage Pond No. 2 was noted. A licensee representative stated that seepage was first suspected when nitrate results from seepage well 2314 increased from a January 1, 1974 thru March 31, 1974 average of 1.4 mg/liter to 160 mg/liters in April, 1974.

The abrupt rise in nitrate concentrations prompted the licensee to increase their sampling activities to further investigate the extent of the problem. Enclosure No. 1 outlines action appearing in the licensee's log book for the period May 13-30, 1974.

As Enclosure No. 1 indicates, there has also been a significant increase in uranium concentrations found in seepage well 2314. The licensee's records indicated an average uranium concentration in seepage well 2314 of 50 $\mu\text{gm/liter}$ for the period January 1, 1974 thru April 30, 1974. A concentration of 6060 $\mu\text{gm/liter}$ was measured on May 24, 1974. Enclosure No. 2 is a graph which shows the uranium and nitrate concentrations for the period May 13-30, 1974.

In an attempt to help identify the seepage area, the licensee has drilled 10 additional seepage wells. See Attachment No. 1 (5/28/74 entry), Enclosure No. 3 and Enclosure No. 4. As of June 14, 1974, none of the new wells located outside of the plant area (M1 - M10) have indicated any seepage.

In a phone conversation on June 14, 1974, a licensee representative stated that since June 6, 1974, three new seepage wells were drilled inside the fenced area on the west, south, and east side of seepage well 2314.

According to the licensee, the new south and west wells have accumulated liquid. Samples have been obtained from these two wells and submitted

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for analyses. As of June 14, 1974, results were not available.

As part of our inspection effort a liquid sample was collected on June 5, 1974, from seepage well 2314 for analyses by Health Services Laboratory, Idaho.

Although there is no violation of Commission's requirements at the time of the inspection, this information may be of interest to Lee Rouse, DML.



Glen D. Brown, Chief
Radiological and Environmental
Protection Branch

Enclosures:
As stated (4)

ENCLOSURE No. 1

Sequence of action prior to and after obtaining a high sample result on seepage well # 2314.

- 4/12/74 1. All seepage wells pumped.
- 4/27/74 All seepage wells sampled (Monthly Routine).
- 5/13/74 1. Routine sample results from 2314, sampled 4/27/74, were received. The Nitrate results were - 160 ppm, Uranium - 10 ugm/l, ²²⁶Ra - 3.6 pCi/l. (Results from Tech. Center). Mr. Brown was informed. This was verified by the Tech. Center.
2. 1,460 gallons of ammonia added to Raffinate # 2.
3. 1245 hrs. - Resampled 2314 - Nitrate = 190 ppm.
4. 1800 hrs. - Pumped well # 2314 - Depth to water before pumping 30' 6". Total depth of well 40'.
- 5/14/74 1. 0730 hrs. - Sampled 2314 (Depth to water 38'). Sample results are as follows:
pH 6.8
Nitrate (N) 184 ppm
NH₄ (N) 6.2 ppm
F⁻ 0.5 ppm
Cl⁻ 54 ppm
SO₄ 200 ppm
Uranium 20 ugm/l.
2. 1030 hrs. - Well # 2314 pumped to near dryness.
3. 1700 hrs. - Several 6" soil core samples (Composited) taken from around 2314 had a nitrate concentration of 20 ugm/l.
- 5/15/74 1. Sampled wells 2305-2312-2313-(2314) results were as follows:
- | | Depth to water | NO ₃ (N) |
|------|----------------|-----------------------------|
| 2305 | 30' | < .01 ppm |
| 2312 | 19' | 0.5 ppm |
| 2313 | 32' | 1.2 ppm |
| 2314 | 39.6' | 236 ppm Uranium 2300 ugm/l. |
2. 1230 hrs. - Soil samples were taken from the roadway ditch south of # 2314. Sample results of 6 samples composited was - Nitrate = 30 ugm/gm.
3. 1630 hrs. - Sampled wells # 2302 & 2319, results were as follows:
- | | Depth to water | Nitrate | Uranium |
|------|----------------|---------|----------|
| 2302 | 2' | 66 ppm | 67 ugm/l |
| 2319 | 35' | 1.6 ppm | 63 ugm/l |

The wells were pumped to near dryness after sampling.

4. 1810 hrs. - Discharge from the SCB was diverted from # 2 raffinate pond into # 1 raffinate pond.

5/16/74

1. 3,600 gallons of ammonia was added to raffinate # 2.
2. 0930 hrs. - Well # 2314 sampled (Depth to water 37'). NO₃ (N) = 245 ppm, Uranium 2300 ugm/l.
3. 1730 hrs. - Sampled the following wells, results were:

	NO ₃ (N)	URANIUM
2302	53 ppm	20 ugm/l
2310	2.6 ppm	< 7.0
2311	0.4 ppm	14
2312	0.3 ppm	< 7.0
2313	< 0.2 ppm	< 7.0
2317	1.2 ppm	< 7.0
2318	2.4 ppm	30
2319	0.2 ppm	14

All wells except 2302 and 2319 were pumped to near dryness after this sampling.

4. Sinke was informed of possible leak, unable to reach Shelley, he was on vacation.

5/17/74

1. 0820 hrs. - Sampled 2314 (Depth to water 37'). Results were Nitrate = 267 ppm, Uranium = 2000 ugm/l.
2. 1030 hrs. - Sampled Carlisle Farm Well (To water 19'). Results were NO₃ (N) = 0.3 ppm.
3. 25 tons of quicklime was put into the south end of raffinate pond # 2 in the a.m.
4. 1330 hrs. - Picked up a sample at the combination stream weir and one of the combination stream at the port access road bridge 15 minutes later. Results are as follows:

	NO ₃ (N)	Uranium
Weir	1.3 ppm	.64 mg/l
Bridge	1.3 ppm	.50 mg/l

5. 1530 hrs. - Sampled small seepage stream originating, flowing into the combination stream, in the south ditch of the port access road - 65 yards east of the combination stream. Results were: NO₃ (N) = .2 ppm, Uranium = 7 ugm/l.
6. One ton of bentonite was applied to the bottom of the SE quadrant of raffinate pond # 2 in the p.m.

5/18/74

1. 1030 hrs. - Sampled well # 2314 (Depth to water 37'). Results were: Nitrate = 240 ppm, Uranium = 1540 ugm/l.

- 5/19/74
1. 0930 hrs. - Sampled well # 2314 (Depth to water 37' 6"). Results were: Nitrate = 270 ppm, Uranium = 1350 ugm/l.
 2. 1530 hrs. - The combination stream was checked for streams flowing into it. There were none found with the exception of the one found and sampled on May 17, 1974.
 3. 1630 hrs. - Sampled the stream flowing into the combination stream from the south ditch of the port access road about 65 yards from the combination stream. Results were: NO₃ (N) = <.2 ppm, Uranium = <7 ugm/l.
 4. 800 gallons of ammonia was added to raffinate # 2.

- 5/20/74
1. 0815 hrs. - The discharge from the SCB was diverted from raffinate # 1 back into raffinate # 2.
 2. 0830 hrs. - Notified Shelley of possible leak in raffinate # 2. He suggested that I start this chron. log.
 3. 0900 hrs. - Sampled 2314 (Depth to water 38'). Results were NO₃ (N) = 270 ppm, Uranium = 740 ppm, pH = 7.1.
 4. 1130 hrs. - The following wells were sampled:

	Depth to water	NO ₃ (N)	Uranium
2302	3'	<7	< 7.0
2310	30'	12	12
2311	37'	17	17
2312	38'	< 7	< 7.0
2313	37'	30	30
2317	29'	< 7	< 7.0
2318	25'	< 7	< 7.0
2319	37'	11	< 7.0

5. A note was given to J. W. Craig, with copies to L. Tharp and B. E. Brown, requesting that I be informed of any action taken in regard to the leakage problem with raffinate # 2. This information is necessary for this log.
6. 1830 hrs. - Sampled 2305 (Depth to water 31'). Results were: NO₃ (N) = <.2, Uranium = 35 ugm/l.

- 5/21/74
1. 0840 hrs. - Sampled 2314 (Depth to water 38'). Results were: Nitrate = 270 ppm ave., Uranium = 834 ugm/l.

- 5/22/74
1. 0830 hrs. - Sampled 2314 (38 ft. to water) Results were: NO₃ (N) = 244 ppm, Uranium = 680 ugm/l. Well was pumped at this time.
 2. 1330 hrs. - Sampled 2413 (38' 6" to water). Results were: NO₃ (N) = 250 ppm, Uranium = 670 ugm/l. Water was stirred up prior to sampling.

3. 1700 - 2115 - Well # 2314 was filled and drained four (4) times. The water was thoroughly agitated with the sample when nearing the bottom of the hole (~6') during the third draining - a sample of this relatively muddy water was taken. Sample results: Nitrate = 22 mg/l, Uranium sol. = 4150 ugm/l, Uranium total = 5260 ugm/l.

- 5/23/74
1. Sampled 2314 (Depth to water 38'). Results were: Nitrate = 32 mg/l, Uranium = 5560 ugm/l.
 2. Attempted to call J. Carter Drilling - No one- reached at 1600 - will call Friday.

- 5/24/74
1. 2314 sampled at 0730 (Depth to water 37'). Results were: Nitrate = 60 ppm, Uranium = 6060 ugm/l, NH_3 (N) = 1.6 ppm.

- 5/25/74
1. 2314 sampled at 0800 (37 ft. to water). Results were: Nitrate = 86 ppm, Uranium = 4730 ugm/l.

- 5/26/74
1. 2314 sampled at 0730 (Depth 37' to water). Results were: Nitrate = 109 ppm, Uranium = 4270 ugm/l.

- 5/27/74
1. 2314 sampled at 0730 (Depth to water 37'). Results were: Nitrate = 122 ppm, Uranium = 4200 ugm/l.

- 5/28/74
1. 2314 sampled at 0730 (To water 37'). Results were: Nitrate = 143 ppm, Uranium = 3420 ugm/l.
 2. Roads were dozed out to permit drilling of several additional test holes.
 3. Telephone conversation with Shelley:
 - a. Discussed soil sampling on the new wells that are to be drilled.
 1. At the 500' centour - sample of sandstone if hit and of blue shale at bottom of hole.
 2. Wells ~50' south of the port access road near 2314. Sample of each strata.
 - b. Well construction is to be as follows:
 1. Drill to blue - gray shale formation.
 2. Install casing with the bottom six feet perforated.
 3. Backfill with gravel to ~7 feet and with top soil from there to the top.

- 5/29/74
1. 2314 sampled at 0730 (Depth to water 37'). Results were: Nitrate = 163 ppm, Uranium = 2930 ugm/l, pH = 7.1.
 2. New well locations marked. J. Carter drilling to be in May 30, 1974.
 3. Requested that engineers update the sampling map (100-XX - 1001) to show new well locations.

5/30/74 1. The following well samples were collected on May 28, 1974.

	Depth to water	NO3 (N)	pH	Uranium
2317	25'	1.1 ppm	7.2	28 ugm/l
2310	27'	3.1	7.4	80
2313	30'	0.6	6.8	28
2312	22'	1.0	7.2	18
2318	20'	1.5	7.2	7
2305	32'	0.7	7.2	28
2302	2'	28.8	6.6	37
2311	37'	0.6	6.8	35
2319	36	0.4	6.6	15

2. Carter drilling representative in to set up for drilling additional test wells. He indicated all wells would be completed on May 31, 1974.
3. Well 2314 sampled at 0730 (Depth to water). Results were: Nitrate = 197 ppm, Uranium = 2860 ugm/l, pH = 7.1.

ENCLOSURE 5.7

Seepage WFL 2314

Δ = URANIUM, $\mu\text{g}/\text{L}$

\square = NITRATE, mg/L

1000

45 6210

SEMI-ANNUAL
CONCENTRATIONS
OF URANIUM AND NITRATE
IN SEEPAGE WATER

100

10

11

13

15

17

19

21

23

25

27

29

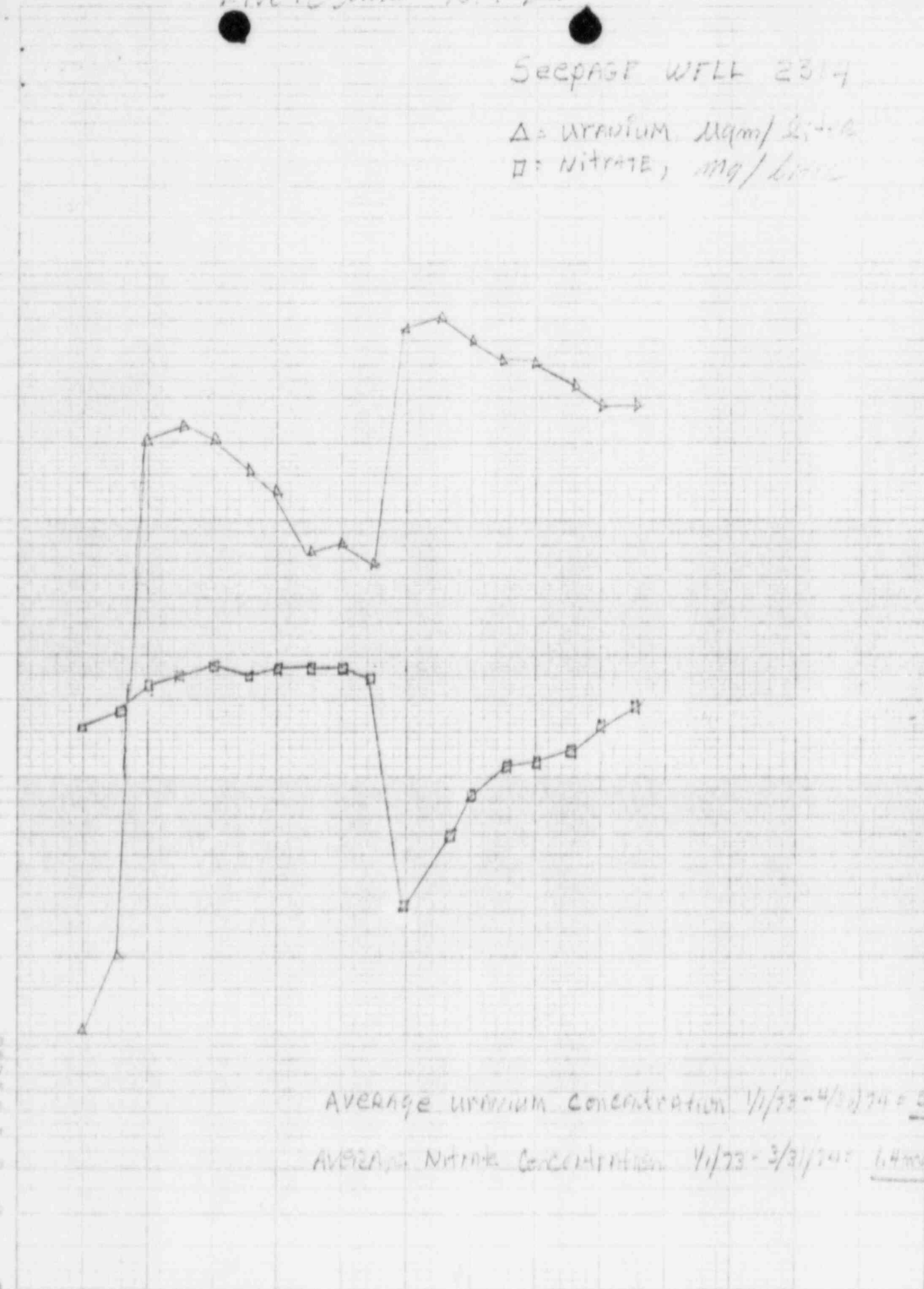
31

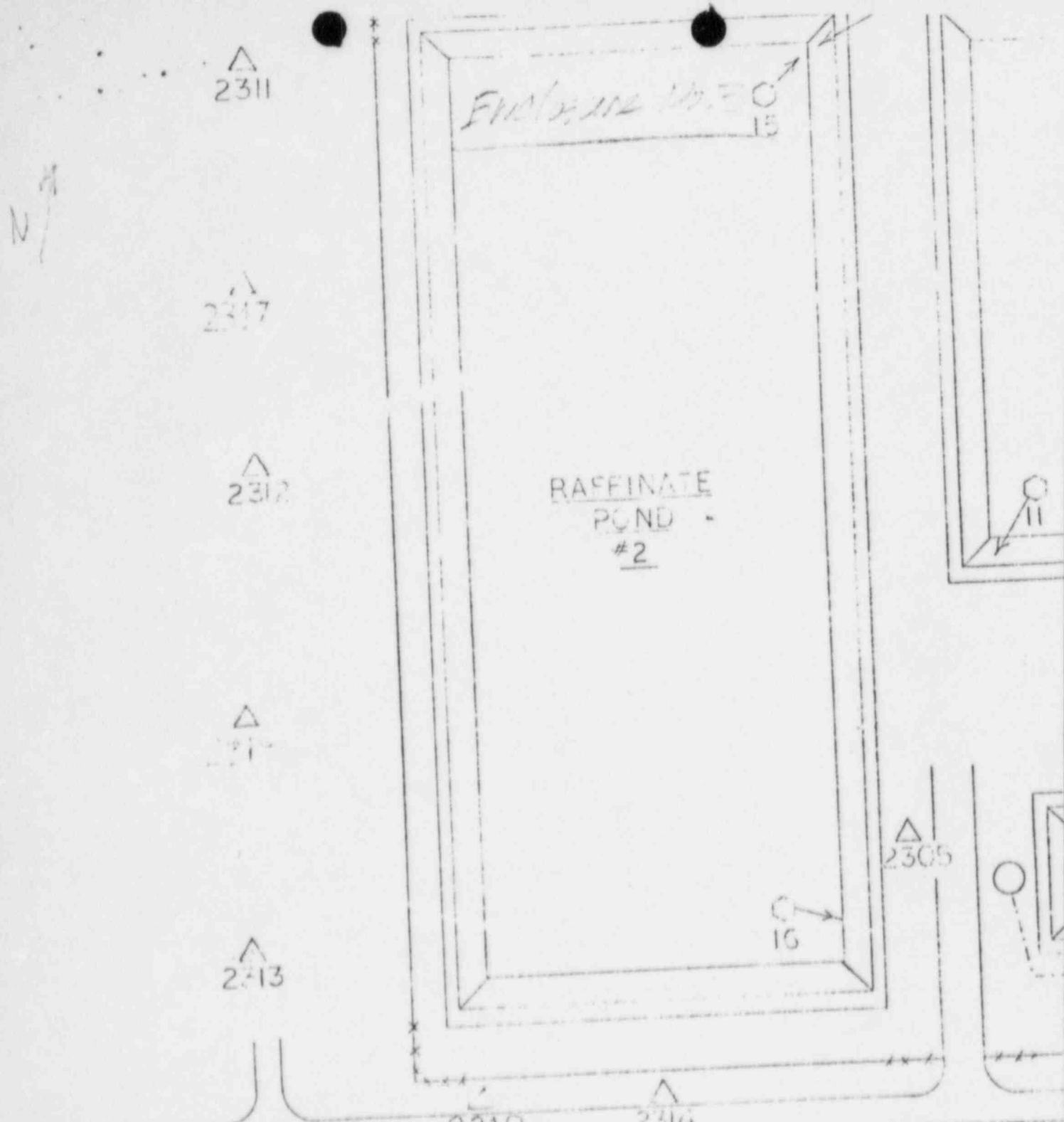
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data - MAY, 1974

AVERAGE URANIUM CONCENTRATION 1/1/73 - 4/30/74 = 5 $\mu\text{g}/\text{L}$

AVERAGE NITRATE CONCENTRATION 1/1/73 - 3/31/74 = 1.4 mg/L





ENCLOSURE NO. 15

RAFFINATE
POND
#2

2305

C16

2311

2317

2312

2313

2319

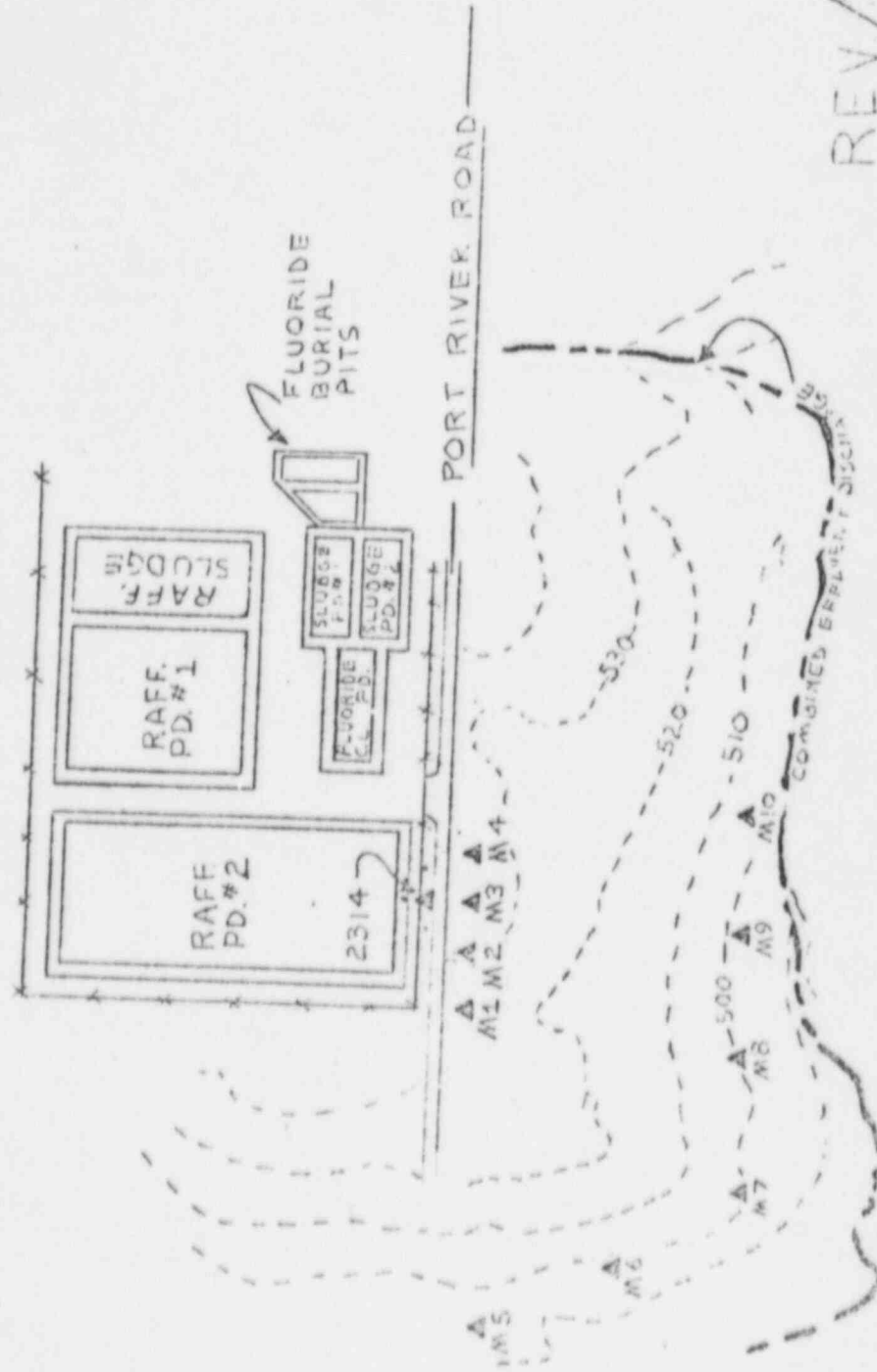
2314

LITTLE RIVER

SEOUCHAH FACILITY
UF plant

SYMBOLS
 Δ SET-AGE WELL
 O LIQUID EFFLUENT SAMPLE POINT

Enclosure No. 4



M4 SEEPAGE MONITOR WELLS DRILLED 6-3-74
SCALE 1 IN. = 400 FT.

October 27, 1972

Note to Files

KERR-MCGEE LICENSE SUB-1010, DOCKET NO. 40-8027

I received a telephone call on October 25, 1972, from Mr. Francis Irving, attorney for Kerr-McGee. He asked if we had received the letter from Kerr-McGee requesting an informal meeting on deep-well disposal prior to a hearing if Kerr-McGee chooses to ask for one. Mr. Irving's concern was that the deadline (October 30) for filing a request for a hearing may pass before they receive a decision from us on their request for an informal meeting. I told Mr. Irving that we have received their letter and have it under consideration. I also indicated that we hope to have a reply in the mail before the October 30 deadline and that we would telephone them to let them know what the reply contains. I further informed Mr. Irving that if the deadline for filing a request for a hearing passes before they get a reply from us, they would be given further opportunity to consider our reply and subsequently request a hearing if they so desired.

Richard E. Cunningham

Richard E. Cunningham
Assistant Director for Materials
Directorate of Licensing

cc: S. H. Smiley
J. C. Malaro
C. R. Buchanan
J. M. Becker
G. R. Grove

bcc: L:FM R/F
RECunningham, L:NM
✓ Docket File 40-8027

OFFICE ▶	L:NM
SURNAME ▶	RECunningham/mr
DATE ▶	10/27/72

FROM

Kerr-McGee Nuclear Corporat

DATE OF DOCUMENT

August 11, 1976

DATE RECEIVED

August 17, 1976 1395

NO

LTR

MEMO

REPORT

OTHER

TO

E. Morris Howard
Region IV

ORIG.

CC

OTHER

ACTION NECESSARY ☐CONCURRENCE ☐

DATE ANSWERED

NO ACTION NECESSARY ☐COMMENT ☐

BY

CLASSIF

POST OFFICE

U

REG. NO.

FILE CODE

40-8027

DESCRIPTION: (Must Be Unclassified)

Letter transmit reporting the release
of natural uranium in effluents to
unrestricted areas during the first
half of 1976.

REFERRED TO

DATE

RECEIVED BY

DATE

Rouse; 2 extras

8-17

REG FILE COPY

PDR

LPDR

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1395

11, Jr.

REMARKS

U. S. NUCLEAR REGULATORY COMMISSION

MAIL CONTROL FORM

FORM NRC 326
(1-75)