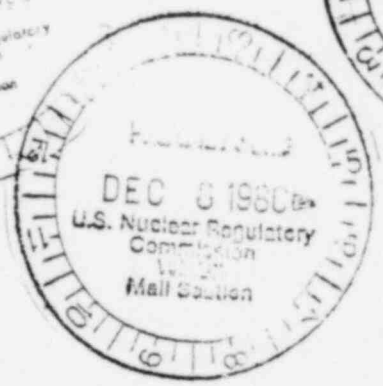
PDR 40-8728

UNC TETON EXPLORATION DRILLING, INC.

Subsidiary of United Nuclear Corporation
A UNC RESOURCES Company
P.O. Drawer A-1
Casper, Wyoming 82602
Telephone 307/265-4102



December 4, 1980

CERTIFIED MAIL

Mr. Hub Miller
Uranium Recovery Licensing Branch
Division of Waste Management
US Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Miller

RE: Source Material License No. SUA-1373
Docket Number 04008728

Please find attached our report on the Leuenberger Reservoir leakage situation you were notified of by phone on November 3, 1980, as required under the provisions of the above referenced license. There has been no leakage problems in these ponds until the operating levels were raised for the first time above previous use levels due to greater volumes of water during the restoration phase of the project.

In transferring water from the South Pond to facilitate repairs, the North Pond level was increased higher than it had ever been and additional leaks were identified. Although repairs ave been somewhat hampered by inclement weather we feel that the situation is under control and all leaks in both ponds will be completely repaired very soon.

The enclosed report provides details of the actions taken to date and our most recent chemical analysis of the pond water. Should you have any questions or need additional information, please feel free to call me at any time.

Thank you for your cooperation and understanding of this situation.

Sincerely yours,

Richard R. Appel

Richard R. Appel
Permits Coordinator

dkt
xc: Documents Office
enclosure: Leuenberger Pond Leakage Report, dated December 3, 1980

8101100026

REPORT SUBMITTED TO REGULATORY AGENCIES

LEUENBERGER RESERVOIR LEAKAGE REPORT

December 3, 1980

Submitted to: US NRC
Wyoming DEQ Water Quality Division
Wyoming DEQ Land Quality Division

LEUENBERGER RESERVOIR LEAKAGE REPORT
December 3, 1980

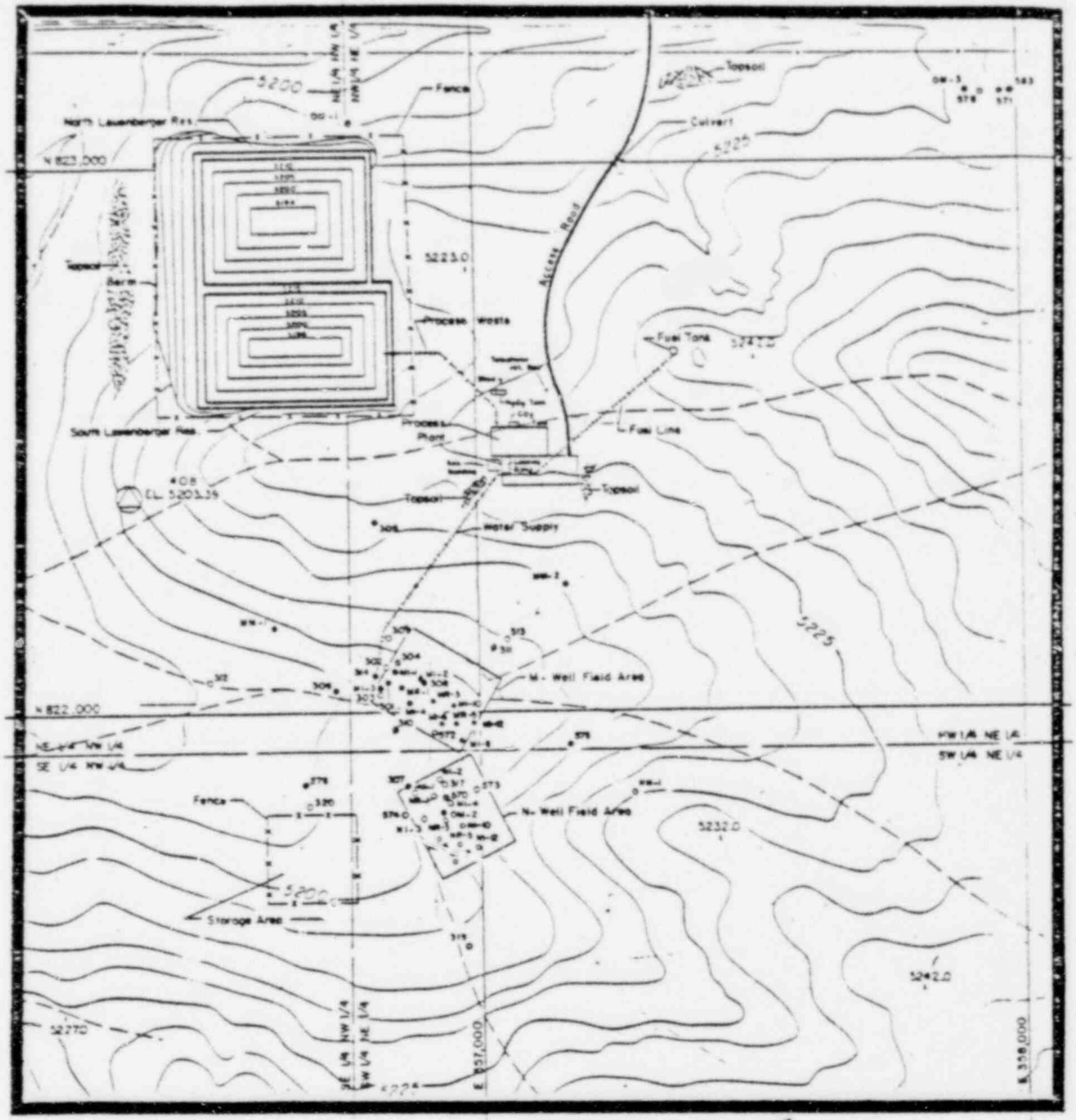
INTRODUCTION

This report discusses a small but detectable leakage problem associated with the North and South Leuenberger Reservoirs at the Leuenberger In Situ Uranium Research and Development Project, Converse County, Wyoming. The location of the North and South Leuenberger Reservoirs is illustrated on Figure 1. In this report the North Leuenberger Reservoir is referred to as the North Pond and the South Leuenberger Reservoir is referred to as the South Pond in keeping with the terminology used at the Leuenberger site. The ponds are used as solar evaporation ponds in conjunction with the Leuenberger Research and Development Project. Details concerning the R&D operation can be referenced in the U.S. NRC Source Material License Number SUA-1373 (Docket Number 40-8728) Environmental Report, and the Wyoming Department of Environmental Quality Research and Development Testing License 2RD Application Report retained on file at these agencies.

Water was noted in the leak detection systems for the North and South Ponds on Friday, October 31, 1980. Probable leakage was confirmed on November 1, 1980, and the regulatory authorities were appraised of the situation by telephone on Monday, November 3. During the month of October substantial amounts of water had been discharged to the North and South Ponds as a result of the ongoing ground water restoration efforts at the Leuenberger Site as required by the referenced licenses. This discharge to the ponds represented a relatively rapid rise in water level in the ponds and resulted in the detected pond leakage. Discharge to the ponds from the ground water restoration efforts was terminated when the leaks were detected and confirmed.

STATEMENT OF SITUATION

On Thursday, October 30, a small floating sprinkler apparatus was placed in the South Pond to determine if such a system would be helpful to enhance evaporation of water from the South Pond in keeping with the Research and Development efforts. Difficulty was experienced when placing the sprinkler float into the South Pond and it was suspected that the liner may have been damaged just below the water line. The next day, October 31, both the North and South Leak Detection Systems contained fluid. The water from the systems was sampled and the samples were analyzed. Conformation samples were collected on the following day, November 1, 1980. Results of these and other analyses from the North and South Pond Leak Detection Systems are reported in Table 1.



T.34N., R.74W.
Within Section 14

Research & Development
License Area Boundary

Contour Intervals = 5'

0 100 200 300 500 800 Feet

0 50 100 200 Meters

• THE COORDINATES USED ARE AFTER THE WYOMING STATE COORDINATE SYSTEM.

•• ALL DRILL HOLE NUMBERS ARE PRECEDED BY A 'PNS-' INDEX NUMBER.

LEGEND

- Upper Idaho Aquifer Well
- Lower Idaho Aquifer Well
- Confining Layer Below Lower Idaho Aquifer Well
- N Aquifer Well
- M Aquifer Well
- Basal Aquifer Well
- Well Sealed
- Unless Noted

FIGURE 1 Location of North and South Leuenberger Reservoirs

TABLE 1

CHEMICAL CONCENTRATIONS FOR
LEUENBERGER RESERVOIR LEAK DETECTION SYSTEMS

North Pond Detection Water

Sample Date 1980	Conductivity umhos/cm	Cl^- mg/l	$SO_4^=$ mg/l	U mg/l	Na^+ mg/l	Alkalinity (as mg/l $CaCO_3$)
10-31	3980	980	NA	7.4	NA[1]	574
11- 1	2900	679.8	NA	5.9	NA	549
11- 2	4350	1250	380	9.7	NA	580
11- 9	3220	720	382	7.0	521	520
11-20	3210	670	401	6.8	674	500
11-24	2935	590	398	6.3	NA	480

South Pond Detection Water

Sample Date 1980	Conductivity umhos/cm	Cl^- mg/l	$SO_4^=$ mg/l	U mg/l	Na^+ mg/l	Alkalinity (as mg/l $CaCO_3$)
10-31	1780	153	NA	2.5	NA	466
11- 1	1590	155.4	NA	3.3	NA	502
11- 2	1650	129	334	3.9	NA	490
11- 9	2220	334	348	5.2	434	500
11-13	2630	490	350	5.6	559	500
11-18	2686	520	365	5.6	570	480
11-23	2365	430	289	4.8	505	430

NA = not available or not analyzed

CORRECTIVE ACTION

Figure 2 illustrates a time line schematically representing the general sequence of events that has transpired since the leakage situation was identified.

On Saturday, November 1, after the leak was confirmed a high capacity pump with a 800 gpm to 1,200 gpm pumping rate was ordered. The pump arrived on site on Sunday, November 2. In that a leak was suspected in the South Pond, water was transferred from the South Pond to the North Pond until the water level that existed in the South Pond prior to ground water restoration was achieved. Water transfer was finished on Monday, November 3, and it was apparent that the liner was damaged during the placement of the sprinkler float. The entire liner was inspected above the water line and any seams or areas that were considered potential areas of future leaks were repaired. The hole that resulted from the sprinkler installation was also repaired.

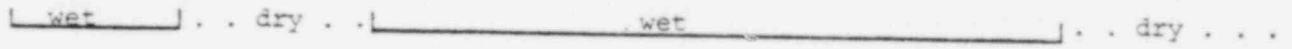
The "dry" period for the South Pond Leak Detection System on Figure 2 corresponds with the time period when water was transferred to the North Pond and repair work was taking place in the South Pond. The following "wet" period on this time line indicates that some of the patches did not adhere satisfactorily when water was returned from the North Pond to the South Pond to check the repair work. The water had to be returned to the North Pond to a point where the South Pond was no longer leaking.

The "wet" period for the North Pond Leak Detection System corresponds to leakage on the North Pond when the pond was about three-quarters full. The subsequent "dry" period denotes the time water was returned back to the South Pond to check the repair work in the South Pond and to facilitate repair work in the North Pond. The long "dry" period for the North Pond indicates that no leaks exist at the lower levels in the North Pond. The second "wet" period for the North Pond Leak Detection System on Figure 2 indicates that a leak exists at a high level in the North Pond and resulted when almost all the water in the South Pond had been transferred to the North Pond.

ASSESSMENT

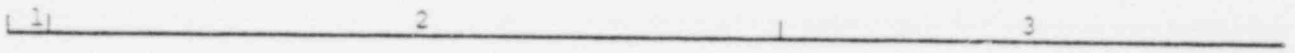
The North Pond had been in leakage status from Friday, October 31, to Sunday, November 9. No leakage was observed in this pond during general cycles of water transfer between November 9 to November 20. Leakage in the North Pond was again observed on Thursday, November 20, and the detection system remains in this status at the present time. The South Pond had been in leakage status from October 31 to November 4, and essentially from November 9 to November 27. At this time the South Pond is not in leakage status.

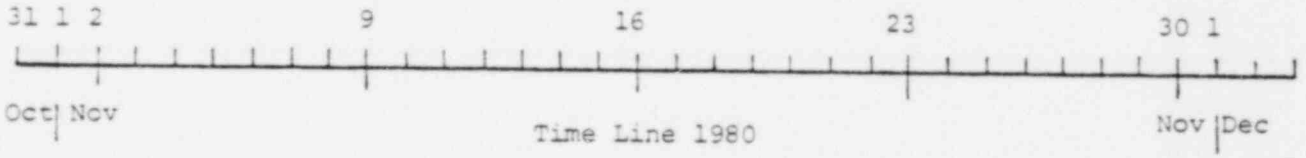
The amount of water loss through leakage is difficult to determine. The volume of water loss, however, is considered small in that the change in water level elevation in the ponds before and after the sequence of transfers cannot be seen to change over several days. Perhaps a leakage rate of 10 gpm during the time that leakage is occurring for a given pond would be a reasonable estimate.



South Pond Leak Detection System Status (see definitions below)

North Pond Leak Detection System Status





Time Line 1980

Definitions

Term	Meaning
Wet	Leak detection system indicates pond leak.
Dry	Leak detection system indicates pond is not leaking.
1	Leak problem identified and confirmed.
2	High capacity pump ordered, regulatory agencies notified, water transfer sequence between ponds commence.
3	Increase elevation in water in North Pond identified a new leak at the upper levels.

FIGURE 2 Status of Pond Repair Efforts

Table 2 lists the chemistry of the water within the ponds prior to leakage. The chemistry of the water in the ponds is within livestock standards for most parameters. The transfer of water between the ponds has caused mixing of these waters, and the chemistry of both ponds are approaching an average concentration. Most of the total dissolved solids in the ponds are attributable to high levels of sodium, chloride and bicarbonate which are not particularly harzardous. The radium-226 levels are approximately equal to or slightly less than the radium concentrations characteristic of typical ore bodies. Radium is believed to have a high absorptive capacity onto clays and typically is not transported to any distances in ground water systems.

No immediate hazard is contemplated as a result of the pond water leakage situation. Notwithstanding we are continuing to make an effort to remedy the situation as soon as possible. After the South Pond is repaired, water will be transferred from the North Pond to the South Pond. At this point the remaining leak in the North Pond can be repaired so that our ground water restoration efforts may continue.

TABLE 2
CHEMISTRY OF WATER IN LEUENBERGER RESERVOIRS
(Chemical units in mg/l except as noted)

SAMPLE	NORTH POND	NORTH POND	SOUTH POND	SOUTH POND
Laboratory	Teton	Teton	Teton	Teton
Job ID	1167	1791	1166	1792
Date Sampled	6- 3-80	10-14-80	6- 3-80	10-14-80
Date Analyzed	6- 4-80	10-15-80	6- 4-80	10-15-80
pH (units)	8.65	8.4	10.0	8.5
Conductivity (µmhos/cm)	7400	5675	3160	1640
HCO_3	656	771	994	517
CO_3	128	57.6	607	69.6
Ca	32.0	42	8.5	41
Cl	2741	1580	353	106
F	.19	.35	.28	.29
Mg	17.5	38	6	35
K	14.5	19	8.5	16
Na	2050	1561	870	360
SO_4	377	390	132	326
As	<.015	.008	<.005	.010
Ba	.08	<.1	<.05	<.1
Cd	<.01	<.01	<.01	<.01
Cu	<.05	<.05	<.05	<0.05
Fe	.20	.42	.21	.18
Pb	<.05	<.05	<.05	<.05
Mn	<.05	<.05	<.05	<.05
Mo	.10	<.1	<.05	<.1
Ni	<.05	.08	<.05	<.05
Ra-226 (pci/l)	11.72±1.22(1)	165±15(2)	291±14(1)	189±15(2)
Se	<.005	.093(3)	<.005	.178(3)
U	7.5	10.1	3.3	3.8
V	.43	<.1	.09	<.1
Zn	.06	<.05	.17	<.05
TDS	5492	1160	2154	564

(1) Sampled on 6-16-80
(2) Sampled on 9-2-80
(3) Sampled on 10-27-80