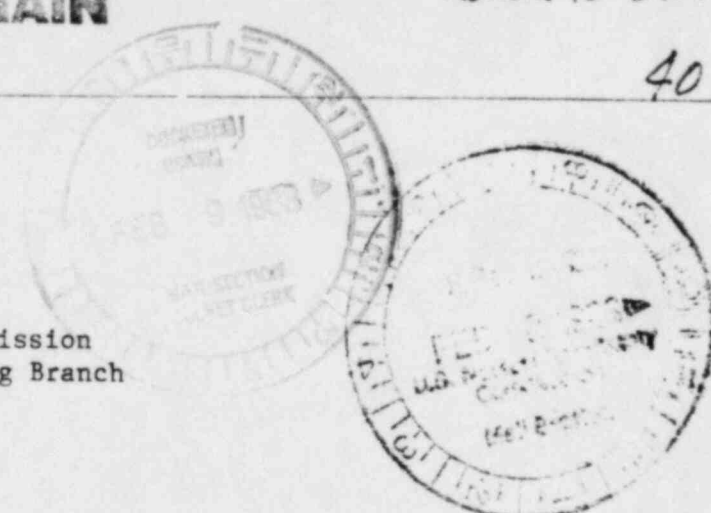




A Subsidiary of
Union Pacific Corporation

January 25, 1983

Mr. Dale Smith
U. S. Nuclear Regulatory Commission
Uranium Recovery and Licensing Branch
Mail Stop 461-S3
7915 Eastern Avenue
Silver Spring, MD 20910



Dear Mr. Smith:

RE: License SUA-1228 Docket No. 40-8380 (Nine Mile Lake)
Quarterly Report: Fourth Quarter, 1982

To comply with license condition 36, this report covers the period October 1 through December 31, 1982.

STATUS OF PROJECT ACTIVITIES

Restoration efforts ceased February 1, 1982. The primary activities during the quarter were monthly environmental samplings of air and groundwater.

Tables 1 and 1A summarize Pattern 1 well samplings for the quarter. Pattern 1 water is characterized by high soluble salt levels, yet low in metals. All parameters remained relatively stable for the quarter.

Water quality within the Pattern 2 interior remained relatively stable during the quarter. Monitor well M-21 shows fluctuating vanadium values, however is within baseline for other parameters.

Tables 2 and 2A summarize results during the quarter for the interior production well (P-15), the downdip injection well (I-17), and the perimeter monitor wells (M-20 through M-23).

Tables 3 and 3A list Pattern 3 results. Evaluation of data indicates water quality to be relatively stable with the exception of Radium-226 in production well #50.

The final restoration report for the acid-leached patterns (1, 2, and 3) was submitted to the NRC and DEQ during the third quarter of 1982. Official response to the report is pending.

Stabilization monitoring of Pattern 4 was completed February 1, 1982. Subsequent samplings indicate little, if any, change in water quality within the pattern. Tables 4 and 4A present water quality data for the Pattern 4 production and monitor wells.

MASS BALANCE SUMMARIES

All circuit operations were inactive during the quarter; therefore, mass balance summaries are not applicable.

8302240049 830125
PDR ADDCK 04008380
PDR

SL Development
PO Box 3719
Casper, Wyoming 82601
307 237-8326

DESIGNATED ORIGINAL

Certified by

B. Fisher

FEE EXEMPT

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Info only

Mr. Dale Smith
January 25, 1983
Page Two

AIR QUALITY DATA

Tables 5-8 list radiometric particulate, area T'D, radon gas and radon progeny data. Due to lengthy turn-around by commercial laboratories, the particulates are for the third quarter of 1982. Fourth quarter results will be included on the next report. Air quality data for the quarter are below regulatory limits. All air quality values approximate previous reports from the past few years.

RESERVOIR DATA

Both reservoirs at Nine Mile Lake evaporated to near-dryness during the quarter, thus water quality data is not available. Upon decommissioning, any sludge in the reservoirs will be transported to Bear Creek Uranium for disposal.

SURFACE DISCHARGE

An NPDES surface discharge permit was obtained during the fourth quarter of 1981 and treated water was discharged to the surface until February 1, 1982. No surface discharge has occurred since February 1.

QUARTERLY ALPHA SURVEY

Table 9 lists the alpha contamination survey of the work areas. All values were below 1000 dpm per 100 cm² total alpha.

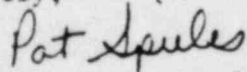
PROPOSED ACTIVITIES FOR FIRST QUARTER, 1983

At this time, no further mining or restoration is planned for Nine Mile Lake. Planned activities for the first quarter are continuance of environmental sampling and security of the test facility.

Groundwater sampling of the acid patterns will continue until concurrence of restoration has been received. The restoration report for the carbonate pattern (#4) will be submitted during 1983.

If you have any questions, please give me or Mike Neumann a call.

Sincerely,



P. R. Spieles
Superintendent, Facility Operations

PRS/jg
Attachments

cc: F. Ross/K. Kalman
NRC, Region IV
NRC, Document Management Branch
K. Ogle (DEQ)
R. Chancellor (DEQ, District IV)
T. Mueller (DEQ, District IV)

L. W. Hersloff
J. A. Yellich
M. R. Neumann
R. E. Iwanicki
D. Leanox (DEQ, WQD)
7.12-5

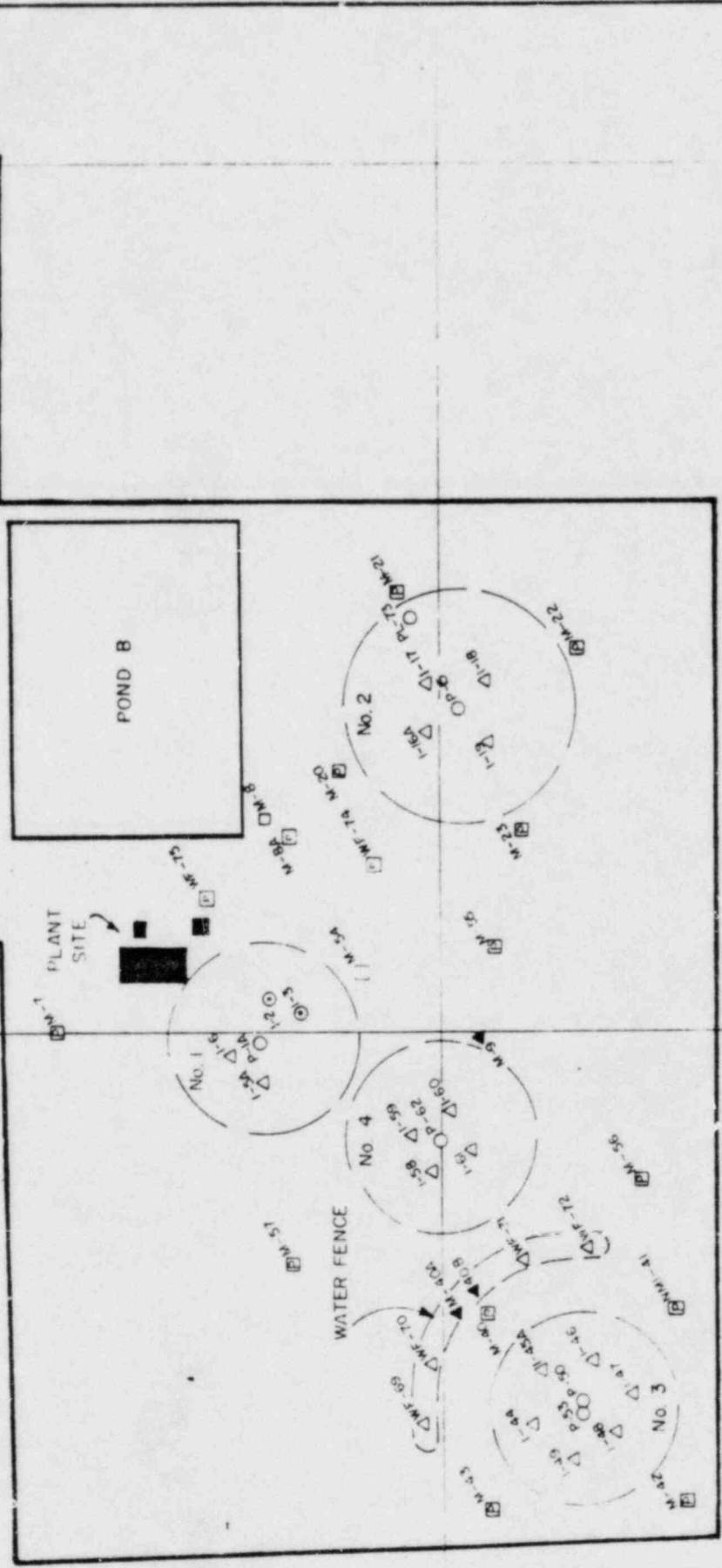
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Sheet No.

Rocky Mountain Energy

E 775000

E 774000



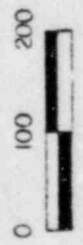
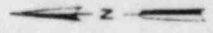
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**NINE MILE LAKE
I. S. L. TEST SITE
WELL LOCATIONS**

File Dwg. No.

Revisions		Issue	Date
No.	By	S. J.	12-22-81
1	JCR	KJ	6-15-82
2			
3			
4			
5			
6			
7			
8			
9			
10			



- - PRODUCTION WELL
- △ - INJECTION WELL
- - MONITOR WELL
- ▲ - INJECTION OR MONITOR WELL
- ▣ - PERIMETER MONITOR WELL
- ⊗ - PRODUCTION OR INJECTION OR MONITOR WELL
- ⊙ - PRODUCTION OR INJECTION WELL

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TABLE 1
NINE MULE LAKE
PATTERN 1 MONTHLY WELL DATA

Well #	Sample Date	pH	Conductivity μ mhos/cm	Bicarbonate mg/l	Sulfate mg/l	Iron mg/l	Calcium mg/l	Uranium (U^{38}) mg/l
M-7	Baseline Mean	7.2	3650	339	1350	0.82	100	0.1
	October, 1982	6.6	3400	339	1676	0.01	115	0.125
	November, 1982	6.9	3100	358	1773	0.04	133	0.190
	December, 1982	----- N O S A M P L E -----						
M-8A	October, 1982	6.7	2800	325	1366	1.20	87	0.056
	November, 1982	6.7	2750	328	1361	1.05	100	0.062
	December, 1982	6.9	2500	317	1365	1.68	115	0.048
M-9	Baseline Mean	6.9	3200	342	1200	0.82	92	0.2
	October, 1982	6.5	3500	238	1691	0.07	100	0.122
	November, 1982	6.5	3500	244	2083	0.11	100	0.177
	December, 1982	6.7	3500	250	2140	0.12	128	0.155
M-57	Baseline Mean	6.9	2621	310	1267	0.34	87	0.100
	October, 1982	6.6	2100	232	1077	1.00	46	0.074
	November, 1982	6.8	2200	238	1087	0.63	53	0.130
	December, 1982	6.8	2200	235	1024	1.72	63	0.069
P-1a	Baseline Mean	6.7	3070	271	1180	0.01	80	0.10
	October, 1982	6.4	10400	397	7086	1.42	373	0.747
	November, 1982	6.5	11400	403	6290	1.27	356	0.924
	December, 1982	6.6	10750	412	6926	0.99	378	1.002
I-2	Baseline Mean	----- N O T T A K E N -----						
	October, 1982	6.3	9600	317	5446	0.93	291	0.125
	November, 1982	6.3	10250	320	6123	1.08	361	0.124
	December, 1982	6.5	10250	339	5156	0.72	346	0.117
M-54	Baseline Mean	6.5	6494	268	3767	1.31	235	0.106
	October, 1982	6.1	8750	227	5433	0.99	257	0.187
	November, 1982	6.2	8800	239	5420	1.22	278	0.273
	December, 1982	6.3	8700	250	5763	1.58	337	0.242

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TABLE IA
NINE MILE LAKE
PATTERN I QUARTERLY WELL DATA

	PATTERN BASELINE RANGE	P-1A 11/07/82	I-2 11/03/82	M-7 11/05/82	M-8A 11/04/82	M-9 11/03/82	M-54 11/04/82	M-57 11/07/82
pH	6.6-7.1	6.5	6.3	6.9	6.7	6.5	6.2	6.8
Conductivity	2860-3650	11400	10250	3100	2750	3500	8800	2200
<u>Major Constituents</u>								
Bicarbonate ⁻	271-370	403	320	358	328	244	239	238
Carbonate	0-0	0	0	0	0	0	0	0
Alkalinity as CaCO ₃	222-503	330	262	293	269	200	196	195
Calcium	71-104	356	361	133	100	100	278	53
Chloride	1.8-4.9	119	124	40	36	46	109	24
Magnesium	46-63	161	214	66	54	49	139	33
Potassium	7.0-16.2	18.0	18.0	11.2	10.8	12.0	17.8	9.0
Sodium	560-772	2635	2386	722	546	822	1975	484
Sulfate	1100-1450	6290	6123	1773	1361	2083	5420	1087
TDS	2225-2780	11150	9390	2920	2270	3230	8060	1810
Anion/Cation		102	101	100	98	96	96	99
<u>Minor Constituents</u>								
Arsenic	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Iron	ND-1.42	1.27	1.08	0.04	1.05	0.11	1.23	0.63
Selenium	ND-0.07	0.022	<0.005	0.110	<0.005	0.15	<0.005	0.038
Vanadium	ND-0.1	0.21	<0.01	0.08	<0.01	0.31	0.13	0.36
<u>Radiochemistry</u>								
Uranium (U ²³⁸)	0.002-2.00	0.924	0.124	0.190	0.062	0.177	0.273	0.130
Radium-226	0.6-92	400	110	11.0	26	100	1100	13

NOTE: All units expressed in mg/l (ppm) except conductivity (µmhos/cm), pH (standard units) and radionuclides (pCi/l).

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TABLE 2
NINE MILE LAKE
PATTERN 2 MONTHLY WELL DATA

Well #	Sample Date	pH	Conductivity μ mhos/cm	Bicarbonate mg/l	Sulfate mg/l	Calcium mg/l	Iron mg/l	Uranium (U^{6+}) mg/l
P-15	October, 1982	5.9	3250	127	1588	81	1.30	0.139
	November, 1982	6.1	3200	128	1581	109	1.43	0.136
	December, 1982	6.1	3100	137	1774	105	1.00	0.079
M-20	October, 1982	6.5	3500	290	1823	89	0.48	0.350
	November, 1982	6.6	3400	293	1949	85	0.42	0.381
	December, 1982	6.7	3400	296	2020	109	0.47	0.442
M-21	October, 1982	6.5	2500	276	1223	78	0.51	0.127
	November, 1982	6.7	2500	282	1237	87	0.54	0.167
	December, 1982	----- N O			S A M P L E -----			
M-22	October, 1982	6.6	2600	261	1425	82	0.39	<0.001
	November, 1982	6.7	2600	267	1451	90	0.47	0.024
	December, 1982	6.8	2500	272	1513	96	0.33	0.001
M-23	October, 1982	6.6	2400	276	1269	66	0.21	0.196
	November, 1982	6.6	2500	281	1283	70	0.25	0.227
	December, 1982	6.7	2400	285	1203	88	0.25	0.167
I-17	October, 1982	6.2	2800	212	1469	71	1.47	0.051
	November, 1982	6.4	2800	233	1461	91	1.55	0.058
	December, 1982	6.5	2600	220	1466	87	1.43	0.052
Pattern Baseline Range		6.4-7.2	1950-4000	256-315	1150-2800	50-160	ND-1.11	0.015-0.750

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TABLE 2A
NINE MILE LAKE
PATTERN 2 QUARTERLY WELL DATA

	PATTERN BASELINE RANGE	P-15 11/07/82	I-17 11/04/82	M-20 11/04/82	M-21 11/04/82	M-22 11/05/82	M-23 11/05/82
pH	6.4-7.2	6.1	6.4	6.6	6.7	6.7	6.6
Conductivity	1950-4000	3200	2800	3400	2500	2600	2500
<u>Major Constituents</u>							
Bicarbonate-	256-315	128	233	293	282	267	281
Carbonate	0-0	0	0	0	0	0	0
Alkalinity as CaCO ₃	210-258	105	191	240	231	219	230
Calcium	50-160	109	91	85	87	90	70
Chloride	9-150	42	35	38	34	33	35
Magnesium	12-129	57	36	73	47	54	45
Potassium	7.5-25.0	12.0	11.1	13.1	11.1	11.5	11.3
Sodium	507-840	652	565	305	533	547	525
Sulfate	1150-2800	1581	1461	1949	1237	1451	1283
TDS	2028-3486	2520	2320	3110	2090	2330	2110
Anion/Cation		103	96	99	101	96	97
<u>Minor Constituents</u>							
Arsenic	ND-0.01	0.010	0.012	<0.005	<0.005	<0.005	<0.005
Iron	ND-1.11	1.43	1.55	0.47	0.54	0.47	0.25
Selenium	ND-0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium	ND-0.05	1.01	0.04	0.04	3.4	0.09	0.21
<u>Radiochemistry</u>							
Uranium (U ²³⁸)	0.015-0.750	0.136	0.058	0.442	0.167	0.024	0.227
Radium-226 ³⁸	19-717	530	100	230	290	200	250

NOTE: All units expressed in mg/l (ppm) except conductivity (μ mhos/cm), pH (standard units) and radionuclides (pCi/l).

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TABLE 3
NINE MILE LAKE
PATTERN 3 MONTHLY WELL DATA

		pH	Conductivity μ mhos/cm	Bicarbonate mg/l	Sulfate mg/l	Calcium mg/l	Iron mg/l	Uranium (^{238}U) mg/l
Pattern Baseline Range		6.4-7.6	1200-3500	176-507	628-2826	41-135	0.1-4.1	0.002-0.200
P-50	October, 1982	6.3	1450	125	627	21	0.20	0.085
	November, 1982	6.5	1525	128	576	32	0.30	0.005
	December, 1982	6.5	1475	127	576	36	0.24	0.029
P-53	October, 1982	5.5	1600	49	712	20	2.82	0.048
	November, 1982	5.8	1600	53	760	29	2.92	0.098
	December, 1982	5.7	1525	53	728	30	2.41	0.050
M-40	October, 1982	7.0	1500	188	539	31	0.21	0.046
	November, 1982	7.1	1500	188	549	35	0.16	0.106
	December, 1982	7.4	1475	195	543	43	0.61	0.051
M-41	October, 1982	6.6	1600	192	644	32	0.71	0.041
	November, 1982	6.9	1650	198	673	39	0.51	0.042
	December, 1982	6.9	1585	194	604	45	0.31	0.018
M-42	October, 1982	6.6	2500	252	1293	72	0.90	0.060
	November, 1982	6.6	2300	265	1299	79	2.63	0.102
	December, 1982	6.7	2500	264	1097	87	1.75	0.060
M-43	October, 1982	6.8	1860	221	770	41	0.70	0.165
	November, 1982	6.9	1900	227	863	48	0.36	0.207
	December, 1982	7.0	1925	233	877	58	0.38	0.172
I-46	October, 1982	6.5	1675	168	676	36	0.52	<0.001
	November, 1982	6.7	1650	169	640	43	0.27	0.023
	December, 1982	6.7	1575	163	637	47	0.40	<0.001

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TABLE 3A
NINE MILE LAKE
PATTERN 3 QUARTERLY WELL DATA

	PATTERN BASELINE RANGE	M-40 07/03/82	M-41 07/04/82	M-42 11/07/82	M-43 11/17/82	I-46 11/07/82	P-50 11/07/82	P-53 11/07/82
pH	6.4-7.6	7.1	6.9	6.6	6.9	6.7	6.5	5.7
Conductivity	1200-3500	1500	1650	2300	1900	1650	1525	1525
<u>Major Constituents</u>								
Bicarbonate	176-507	188	198	265	227	169	128	53
Carbonate	0-0	0	0	0	0	0	0	0
Alkalinity as CaCO ₃	144-416	154	162	217	186	139	105	43
Calcium	41-135	35	39	79	48	43	32	30
Chloride	20-55	24	24	32	24	26	23	22
Magnesium	13-71	23	21	46	25	25	16	19
Potassium	5.9-16.0	6.0	8.0	10.2	8.6	7.7	7.0	6.7
Sodium	310-863	261	305	507	367	309	265	288
Sulfate	628-2826	549	673	1299	863	640	576	728
TDS	880-3320	990	1170	2105	1425	1100	1050	1125
Anion/Cation		100	98	96	96	97	100	97
<u>Minor Constituents</u>								
Arsenic	0.01-0.04	<0.005	<0.005	0.005	<0.005	0.011	0.024	0.029
Iron	0.01-4.10	0.16	0.51	2.63	0.36	0.27	0.30	2.92
Selenium	0.01-0.04	0.056	0.016	0.026	0.016	<0.005	0.044	0.022
Vanadium	0.01-0.45	<0.01	0.05	0.05	0.08	0.25	0.23	0.88
<u>Radiochemistry</u>								
Uranium (U ²³⁸)	0.002-0.200	0.106	0.042	0.102	0.207	0.023	0.005	0.098
Radium-226	1.5-274	17	32	43	92	200	12000	530

NOTE: All units expressed in mg/l (ppm) except conductivity (μ mhos/cm), pH (standard units) and radionuclides (pCi/l).

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TABLE 4
NINE MILE LAKE
PATTERN 4 MONTHLY WELL DATA

		pH	Conductivity <u>μmhos/cm</u>	Chloride <u>mg/l</u>	Bicarbonate <u>mg/l</u>	Uranium <u>mg/l</u>	Calcium <u>mg/l</u>	Vanadium <u>mg/l</u>
Pattern Baseline Range		6.3-7.1	2400-2900	32-52	254-333	0.04-0.39	57-112	ND-0.32
P-62	October, 1982	6.7	1675	22	206	0.136	19	1.25
	November, 1982	6.7	1750	24	218	0.155	27	1.08
	December, 1982	7.0	1750	26	221	0.131	34	0.84
M-54	UCL	7.5	8413	130	322	0.178	329	0.16
	October, 1982	6.1	8750	104	227	0.187	257	0.09
	November, 1982	6.2	8800	109	239	0.273	278	0.13
	December, 1982	6.3	8700	109	250	0.242	337	0.17
M-55	UCL	7.8	3285	59	320	0.464	133	0.08
	October, 1982	6.5	2700	32	276	0.400	83	0.01
	November, 1982	6.6	2500	34	281	0.458	80	0.10
	December, 1982	6.8	2500	31	284	0.386	95	0.18
M-56	UCL	7.6	3080	57	373	0.193	107	0.37
	October, 1982	6.8	1700	23	180	0.113	36	0.29
	November, 1982	6.9	1650	24	197	0.155	35	0.16
	December, 1982	7.2	1525	21	192	0.096	45	0.32
M-57	UCL	7.8	3218	61	373	0.150	112	0.34
	October, 1982	6.6	2100	28	232	0.074	46	0.29
	November, 1982	6.8	2200	24	238	0.130	53	0.36
	December, 1982	6.8	2200	27	235	0.069	63	0.20
I-60	October, 1982	6.7	2000	27	236	0.122	37	0.84
	November, 1982	6.8	1960	27	239	0.100	33	0.77
	December, 1982	6.9	1950	25	239	0.103	37	0.38

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TABLE 4A
NINE MILE LAKE
PATTERN 4 QUARTERLY WELL DATA

	PATTERN						
	BASELINE RANGE	M-54 08/03/82	M-55 11/04/82	M-56 11/05/82	M-57 11/07/82	I-60 11/03/82	P-62 11/03/82
pH	6.4-6.8	6.2	6.6	6.9	6.8	6.8	6.7
Conductivity	5500-7500	8800	2500	1650	2200	1960	1750
<u>Major Constituents</u>							
Bicarbonate ⁻	254-291	239	281	197	238	239	218
Carbonate	0	0	0	0	0	0	0
Alkalinity as CaCO ₃	208-239	196	230	161	195	196	179
Calcium	190-282	278	80	35	54	33	27
Chloride	60-118	109	34	24	24	27	24
Magnesium	100-144	139	49	24	33	18	20
Potassium	10-14	17.8	10.6	8.7	9.0	6.9	6.5
Sodium	1107-1709	1975	546	322	484	428	308
Sulfate	3133-4603	5420	1367	723	1087	790	633
TDS	5260-6520	8060	2225	1235	1810	1420	1130
Anion/Cation		96	97	97	99	102	97
<u>Minor Constituents</u>							
Arsenic	0.024-0.050	0.005	0.005	0.006	0.005	0.016	0.047
Iron	0.4-2.7	1.23	0.38	0.23	0.63	0.01	0.05
Selenium	0.002-0.100	0.005	0.005	0.100	0.038	0.43	0.53
Vanadium	0.02-0.15	0.13	0.10	0.16	0.36	0.77	1.08
<u>Radiochemistry</u>							
Uranium (U ²³⁸)	0.063-0.165	0.273	0.458	0.155	0.130	0.100	0.155
Radium-226	270-520	1100	510	23	13	26	36

NOTE: All units expressed in mg/l (ppm) except conductivity (μ mhos/cm), pH (standard units) and radionuclides (pCi/l).

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TABLE 5
 RADIOMETRIC AIR PARTICULATE
 NINE MILE LAKE
 THIRD QUARTER, 1982

<u>Air Particulates</u>	-----10 ⁻¹⁶ μ Ci/ml-----		
	<u>Site</u>	<u>Ra-226</u>	<u>Th-230</u>
Upwind Control (#5)*	-0.3 \pm 3.6	2.9 \pm 6.5	3.0
Downwind of Reservoir A (#3)*	3.7 \pm 5.8	4.9 \pm 9.3	13.0
Downwind of Restricted Area (3A)*	1.3 \pm 4.6	5.6 \pm 6.2	2.2
Inside Process Building (#4)**	11.0 \pm 4.0	6.3 \pm 6.7	30.0

* 10 CFR 20 Limit
 (unrestricted area)

2 x 10⁻¹²

8 x 10⁻¹⁴

3 x 10⁻¹²

** 10 CFR 20 Limit
 (restricted area)

3 x 10⁻¹¹

2 x 10⁻¹²

7 x 10⁻¹¹

TABLE 6
 RADON GAS
 NINE MILE LAKE
 FOURTH QUARTER, 1982

<u>Site</u>		<u>Rn-22 ($\mu\text{Ci}/\text{ml} \times 10^{-9}$)</u>
Upwind Control (#5)*	October, 1982	0.00 \pm 0.98
	November, 1982	0.00 \pm 0.97
	December, 1982	1.40 \pm 1.00
Downwind Boundary (#3)*	October, 1982	0.00 \pm 0.88
	November, 1982	1.12 \pm 0.95
	December, 1982	0.00 \pm 1.00
Process Building Lower Level **	October, 1982	0.00 \pm 1.00
	November, 1982	0.00 \pm 1.21
	December, 1982	0.92 \pm 1.00
Process Building Upper Level **	October, 1982	1.66 \pm 1.27
	November, 1982	0.00 \pm 0.96
	December, 1982	0.13 \pm 1.10

* 10 CFR 20 Limit (unrestricted area) 3.00 $\times 10^{-9}$ $\mu\text{Ci}/\text{ml}$

**10 CFR 20 Limit (restricted area) 3.00 $\times 10^{-8}$ $\mu\text{Ci}/\text{ml}$

TABLE 7
 RADON DAUGHTERS
 NINE MILE LAKE
 FOURTH QUARTER, 1982

SITE	WORKING LEVEL		
	<u>October</u>	<u>November</u>	<u>December</u>
Reverse Osmosis Feed Tank	<0.001	<0.001	0.005
Surface Discharge Surge Tank	<0.001	<0.001	0.005
Upper Deck	0.004	0.010	0.009
Under Deck	0.006	0.002	0.002
Sump Pump	<0.001	<0.001	0.005
Charcoal Columns	<0.001	0.004	0.010
Assay Station	<0.001	0.002	0.004
Lunch Room	0.002	0.007	0.002
Water Lab	0.009	0.010	0.003
Radiation Lab	0.004	0.005	0.003
Main Office	0.002	0.003	0.001
Metallurgical Lab	<0.001	0.003	0.002
Detection Limit		0.001 WL	
10 CFR 20 Limit		0.3 WL	

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TABLE 8
 AREA DOSIMETRY *
 NINE MILE LAKE
 FOURTH QUARTER, 1982

<u>SITE</u>	<u>MREM/QUARTER</u>
Upwind	22.6
Pattern 1	22.2
Pattern 2	34.4
Pattern 3	27.3
Pattern 4	22.2
Downwind Boundary	29.0
Charcoal Columns	361.8
Reverse Osmosis Feed Tank	36.1
Upper Deck	41.1
Water Lab	19.3
Metallurgical Lab	27.5
Radiation Lab	18.1
Foreman's Office	21.8
Receiving Office	25.4
Main Office	20.0
Lunchroom	27.1
Assay Station	26.0

* Dosimetry service performed by Eberline. Badges are exchanged quarterly.

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TABLE 9
QUARTERLY ALPHA SURVEY
NINE MILE LAKE
FOURTH QUARTER, 1982

<u>SITE</u>	<u>TOTAL ALPHA</u> <u>dpm/100 cm²</u>
Metallurgical Lab	92
Water Lab	84
Radiation Lab	63
Assay Station	42
Main Office	42
Lunchroom	84

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