

UNITED NUCLEAR CORPORATION

70-371



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August 3, 1994

Mr. Shawn Ghose, Chief
U.S. Environmental Protection Agency
OK/NM Superfund Enforcement Section (6H-E0)
Region VI
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Semi-Annual Quality Assurance Report
Ground Water Monitoring - First Half of 1994

Dear Mr. Ghose:

In accordance with Section V.A. 15 of the Administrative Order for the Church Rock site, I have enclosed a report regarding performance of ground water monitoring quality assurance procedures during the first half of 1994.

Two sampling episodes occurred in the first half of 1994--in January and in April.

Sincerely yours,

Edward M. Morales
General Manager and
Radiation Safety Officer

EMM:m

Enclosure

cc: Branch Chief, NRC
J. Velasquez, UNC

9408100285 940430
PDR ADOCK 07000371
C PDR

cert # 009 847 071

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Semi-Annual Quality Assurance
Church Rock Site
First Half of 1994
January and April Sampling Events

August 1994

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1.0 Requirements

The quality assurance and control procedures are contained in Section 3.0 of the Remedial Action Plan for the Church Rock site dated April, 1989. The procedures address sampling, chain of custody, laboratory quality control, and data validation.

These requirements became effective July 3, 1989, when United Nuclear received the Administrative Order on the Church Rock site from the Environmental Protection Agency (EPA).

2.0 Field Sampling Procedures

Copies of the field sampling report sheets for the first and second quarters of 1994 are included as Appendix A. These sheets indicate the estimated volume of water purged from the well prior to sampling and the field parameters of pH, temperature, and conductivity. The Field Blank and Rinsate analysis reports are also included in Appendix A.

3.0 Chain of Custody

Copies of the Chain of Custody forms are included as Appendix B. Energy Laboratories, Inc., our contract laboratory, is located in Casper, Wyoming. Energy Labs inspects the sample shipments upon arrival to verify the information on the Chain of Custody form and to determine if samples arrive at the appropriate temperature.

4.0 Laboratory Control

Copies of the Internal Quality Control report prepared by Energy Laboratories and the associated EPA performance evaluations are included in Appendix C.

5.0 Data Validation

Analytical reports are reviewed by the Church Rock General Manager/Radiation Safety Officer after receipt from Energy Labs. Significant increases or decreases and out of range values are identified and the laboratory is requested to recheck the suspect values, the laboratory responds by checking transcription for these items and, where necessary, repeats the analysis. A revised report is then issued for that sample if an error is discovered.

APPENDIX A

Field Data Sheets

WATER DEPTH AND PURGING
1st QUARTER 19 94

Well No.	Month / Day	Time	Water Depth	Purging Method	Est. Vol. Purged
GW-1	1-4-94	1130	54.7	AIR LIFT	5.0 Gal.
GW-2	"	1140	51.3	"	3.0 "
GW-3	"	1200	47.3	"	1.0 "
GW-4	"	1120	47.6	"	2.5 "
1-XX EPA-1	1-10-94	08:50	238.6'	Pumped	7.3 "
EPA-2	"	11:47	171.7'	"	23.7 "
EPA-3	 	 	 	 	
1-XX EPA-4	1-10-94	10:30	200.3'	Pumped	65.2 "
2-XX EPA-5	"	10:55	117.4	"	52.8 "
EPA-7	Pumping		 	 	
2-XX EPA-8	1-10-94	09:54	215.1'	Pumped	82.6 "
1-XX EPA-9	"	10:20	158.6'	"	12.6 "
3-XX EPA-12	"	09:15	EST 189.7'	NO WATER	
2-XX EPA-13	"	09:27	151.3'	Pumped	20.7 "+
6-XX EPA-14	1-11-94	03:30	94.6'	(Pumped until could not) (Pumped until could not)	327.8
7-XX EPA-15	1-10-94	11:16	138.7'	Pumped	37.8 "
1-XX EPA-17	1-4-94	11:45	189.0'	Not Enough WATER	
1-XX EPA-18	1-10-94	09:41	171.1	Pumped	5.6 "
1-XX EPA-22A	"	13:35	53.6	"	14.0 "+
1-XX EPA-23	"	14:20	39.6	(Pumped until could not)	223.0 "+
2-XX EPA-25	"	15:25	46.8	(" " " ")	105.7 +
1-XX EPA-27	1-12-94	13:58	51.2	Pumped	4.1 "
1-XX EPA-28	"	14:06	56.8	"	27.4
X 411	1-4-94	11:02	138.8	HAND RAIL	2.0 "
420	"	11:05	122.7	AIR LIFT	2.0 "X-G.P
1-XX INQ-126	1-4-94	12:38	95.5	 	
N.R. -					
X - Very Little WATER					
G.P. = Gravel Pack					
X = WATER Level up more Than 1'					
X = " " down " " "					
+ = Sandy WATER					
X Oil in 411					

WATER DEPTH AND PURGING

1st QUARTER 19 94

Well No.	Month / Day	Time	Water Depth	Purging Method	Est. Vol. Purged	Notes
* 2-M 501-B	1-4-94	11:51	173.4'	Hand Bail	2.6	G.W. X-G-1
2-M 502-B	"	12:13	158.5'	" "	2.5	"
3-M 503-B	"	11:21	154.7	" "	3.0	"
509-D	"	11:50	49.2	AIR LIFT	10.0	"
515-A	"	13:10	94.0	" "	2.5	"
516-A	"	13:25	91.7	" "	5.0	"
517	"	12:45	91.6	" "	2.0	"
4-M 518	1-4-94	12:28	129.3'	Hand Bail	2.5	" - G.P. -
604	"	12:20	93.3	AIR LIFT	6.0	"
614	"	13:00	88.5	" "	13.0	"
619	"	13:36	123.2	" "	25.0	"
624	"	14:05	92.6	" "	27.0	gals
627	"	14:55	48.8	" "	30.0	"
2-M 632	1-4-94	14:45	41.1	Hand Bail	2.5	"
1-M 639	1-4-94	13:03	38.2	Bailed Causal Truss	4.5	" X
2-M 642	"	13:21	56.8	" " "	13.0	"
644	"	13:34	51.0 EST	NO WATER		
645	"	13:38	46.0 EST	" "		
TWQ-90	"	14:33	76.5 EST.	and - NO WATER		
* 2-M TWQ-29A	"		62.1	Hand Bail	1.5	" +
TWQ-1060	"	14:38	46.5 EST.	NO WATER		
TWQ-141	"	10:15	202.8	AIR LIFT	10.0	gals
TWQ-142	"	10:30	212.6	" "	15.0	"
TWQ-143	"	10:45	218.2	" "	12.0	"
2-M 804	1-4-94	14:12	41.3			
3-M 805	"	13:18	47.9			
3-M 806	"	13:19	47.5			
3-M 807	"	13:15	49.5			
FIELD BLANK						
RINSATE						

X = VERY LITTLE WATER
 * Bailed 501-B DRY
 G.P. = GRAVEL PACK
 + = SANDY WATER
 * Bailed 29-A DRY

GROUND WATER MONITORING FIELD DATA SHEET

SAMPLING

1st QUARTER 1994

22
27
28
Comments

Well No.	Month/Day	Time	Sampling Method	pH	Cond.	Temp.	Comments
GW-1	1-6-94	11:12	Hand Fall	6.8	4200	11.1	
GW-2	"	11:36	"	6.8	4000	9.3	
GW-3	"	11:50	"	6.5	4000	11.5	
GW-4	"	08:46	"	7.2	4900	9.7	
EPA-1	1-11-94	09:04	Pumped	6.7	3300	11.8	
EPA-2	"	11:54	"	6.7	3500	11.6	
EPA-3	1-11-94	10:33	Pumped	6.8	3400	13.6	
EPA-4	"	10:59	"	6.5	6600	12.8	
EPA-5	"	10:59	"	5.7	4500	12.1	
EPA-7	1-6-94	10:14	"	6.7	3400	12.6	
EPA-8	1-11-94	10:12	"	6.7	3400	12.6	Repaired
EPA-9	"	10:30	"	6.1	4300	12.2	
EPA-13	1-11-94	09:35	Pumped	6.1	4300	12.2	
EPA-14	"	08:52	"	5.7	2900	11.3	
EPA-15	"	11:20	"	6.5	2300	12.2	
EPA-17	1-11-94	09:57	Pumped	5.7	4100	11.8	Red precip in
EPA-18	1-11-94	13:55	"	7.0	1500	11.3	Sandy water
EPA-22A	1-10-94	11:37	"	6.6	3500	12.8	"
EPA-23	1-10-94	15:35	"	6.8	2900	12.0	"
EPA-25	"	14:12	"	8.1	3300	11.8	"
EPA-27	1-11-94	14:23	"	7.0	3600	11.7	"
EPA-28	1-5-94	11:06	Hand Fall	6.8	3300	14.5	2.1 in water
EPA-41	"	12:14	"	6.2	2200	11.9	Very little water
NR-1	1-11-94	13:30	Pumped	3.3	6300	12.6	leak in well
EPA-9	1-12-94	13:38	Pumped	4.4	3900	12.0	

3rd QUARTER -

Deep line washed precip into well

Pumped dry - will Recample

*EPA-25 - Pump checked off with SAND-ONCE-THRU down
DATE TAKEN IN LAB AFTER FILTERING.

GROUND WATER MONITORING FIELD DATA SHEET

SAMPLING

1st-QUARTER 19 94

Well No.	Month / Day	Time	Sampling Method	pH	Cond.	Temp. °C	Comments
* 501-B	1-5-94	14:20	Hand Bail/Wall did not Recover				Enough W.
502-B	"	14:36	Hand Bail	4.1	3,500	11.9	
504-B	"	11:52	" "	5.7	3,600	12.2	
509-D	1-6-94	12:22	" "	6.5	4,400	9.8	
515	"	09:22	" "	5.5	6,100	11.1	
516	"	09:51	" "	5.7	7,200	11.4	
517	1-5-94	14:03	" "	4.9	4,100	12.0	
518	"	14:47	" "	3.6	4,100	11.7	
604	1-6-94	09:55	" "	4.3	4,500	11.4	
614	"	09:08	" "	6.7	6,000	10.8	
619	"	10:04	" "	6.6	3,400	11.5	
624	"	11:18	" "	7.2	3,500	10.7	
627	"	14:26	" "	6.9	3,900	12.0	
632	"	11:48	" "	6.5	4,300	11.2	
639	1-5-94	10:5	" "	6.5	2,300	11.6	Bailed day to day
642	"	12:28	" "	7.1	3,100	11.6	
644	X	X	X	X	X	X	
645	X	X	X	X	X	X	
TWQ-9D	X	X	X	X	X	X	
TWQ-29A	1-6-94	13:18	Hand Bail	7.1	3,000	10.8	Bailed day to day
TWQ-106D	X	X	X	X	X	X	
TWQ-141	1-5-94	10:48	Hand Bail	7.7	1,300	12.5	
TWQ-142	"	11:18	" "	7.8	1,200	12.0	
TWQ-143	"	11:33	" "	7.7	1,100	12.8	
801	1-6-94	11:57	pumped	6.4	6,500	12.1	
802	"	12:03	"	6.4	6,100	12.3	
803	"	12:12	"	6.7	4,600	14.1	
BISHA	1-5-94	12:32	X	7.2	55	10.0	
RINSATE	"	12:24	X	6.5	120	9.8	

* 501-B. Well only had 15 GAL - Bailed day.

EPA WELLS

1st Quarter 1994

Date	Well No.	HP	Elevation T.O.P.	Meter Reading Start (-)	Meter Reading End	Gals. Purged	Time for Well to Go Dry Minutes/Seconds
1-10-94	EPA-1	1/2	7035.544	43,571.8	43,579.1	7.3	1 130
"	EPA-2	1/3	7019.485	43,857.4	43,881.1	23.7	5 113
X	EPA-3	1/3	7019.070	X	X	X	X
1-10-94	EPA-4	1/2	7069.798	43,700.6	43,766.8	66.2	10 104
"	EPA-5	1/3	7011.444	43,766.8	43,819.6	52.8	7 138
"	EPA-7	1/3	7011.662	PUMPING	X	X	X
"	EPA-8	1/2	7076.402	43,505.4	43,688.0	82.6	19 142
"	EPA-9	1/3	7076.612	43,538.0	43,700.6	126	31.3
X	EPA-12	1/3	7029.215	X	X	X	X
1-10-94	EPA-13	1/2	7030.467	43,579.1	43,599.8	20.7	2 128
1-11-94	EPA-14	1/2	6965.611	44,255.7	44,583.5	327.8	24 135
1-10-94	EPA-15	5-30	7002.932	43,819.6	43,857.4	37.8	3 122
X	EPA-17	X	7072.495	X	X	X	X
1-10-94	EPA-18	1/3	7046.716	43,599.8	43,605.4	5.6	1 28
"	EPA-22A	1/2	6954.512	43,881.1	43,895.5	14.4	1 17
"	EPA-23	2	6926.312	43,927.0	44,149.0	222.0	15 140
"	EPA-25	1/2	6903.383	44,149.0	44,255.7	106.7	24 1-
"	EPA-27	1/3	6910.946	43,895.5	43,899.6	4.1	122
"	EPA-28	1	6917.861	43,899.6	43,927.0	27.4	1 53

NR-1

GROUND WATER MONITORING FIELD DATA SHEET

WATER DEPTH AND PURGING

2nd QUARTER 19 94

Well No.	Month /Day	Time	Water Depth	Purging Method	Est. Vol. Purged
GW-1	4-11-94	09:52	54.9	Air LIFT	5.0 GAL.
1-x GW-2	"	10:16	50.6	" "	6.0 "
GW-3	"	14:48	47.0	" "	2.0 "
GW-4	"	12:06	47.5	" "	3.5 "
1-x EPA-1	4-18-94	15:30	239.0	pumped	6.9 "
EPA-2	4-18-94	11:56	171.6	"	22.3 "
EPA-3	X	X	X	X	X
1-x EPA-4	4-18-94	14:15	199.3'	pumped	67.7 "
EPA-5	4-18-94	11:24	117.6	"	51.8 "
EPA-7	PUMPING	NG.	X	X	X
EPA-8	4-18-94	13:34	215.0'	pumped	85.3 "
EPA-9	"	14:05	167.9	"	11.9 "
EPA-12	"	15:20	188.0'	NOT enough	water
EPA-13	4-18-94	14:51	161.3	pumped	20.1 "
3-x EPA-14	4-19-94	14:43	97.2	(pumped until cond settled)	"
1-x EPA-15	4-18-94	13:23	139.0	pumped	40.7 "
EPA-17	4-18-94	14:19	199.0'	NOT enough	water X
EPA-18	4-18-94	14:40	171.8	pumped -	3.1 " X
1-x EPA-22A	4-18-94	09:15	54.1'	pumped	17.4 " +
EPA-23	4-19-94	09:23	39.7	(pumped until cond settled)	26.5 " +
* 1-x EPA-25	4-20-94	14:14	47.1	" " "	150.0 " +
EPA-27	4-18-94	10:10	51.6'	pumped	2.6 " X
1-x EPA-28	"	10:22	57.0'	"	26.2 "
* 5-x 411	4-13-94	07:27	133.0	HAND BAIL	2.5 " -oil
420	4-14-94	13:55	122.8	A-R LIFT	3.0 " G.P.
TWQ-126	"	14:12	95.0	X	X

x = WATER level DOWN MORE THAN 1'

xx = " " " " " "

G.P. = GRAVEL PACK

+ = SANDY WATER.

X = VERY LITTLE WATER

* 411 - Lots of oil in well.

* EPA 25 Pump sands down - have to throttle down to keep cleaner.

GROUND WATER MONITORING FIELD DATA SHEET

WATER DEPTH AND PURGING

2nd QUARTER 19 94

Well No.	Month /Day	Time	Water Depth	Purging Method	Est. Vol. Purged
501-B	4-11-94	14:30	173.5	NOT enough	WATER - Gal. X
502-B	4-12-94		158.5	Hand Bailed	3.0"
1-504-B	"	09:15	155.2'	" "	2.5" G.P.
509-D	4-11-94	10:30	49.9	AIR LIFT	9.0"
515-A	"	10:53	94.3	" "	3.0"
516-A	"	11:17	92.2	" "	4.0"
517	"	11:45	91.9	" "	2.5"
1-518	4-12-94	09:45	128.4	Hand Bailed	3.0"
604	4-11-94	11:04	93.6	AIR LIFT	7.0" G.P.
614	"	10:45	88.8	" "	14.0"
619	"	11:26	123.3	" "	30.0"
624	"	10:44	43.0	" "	28.0"
1-627	"	14:28	49.0	" "	98.0"
632	4-12-94	12:49	41.0	Hand Bailed	3.0"
639	"	08:38	38.5	Bailed Sweet Truck	4.0" X
1-642	"	08:52	57.4	" " "	9.0" X
644	"	09:05	51.0 EST	No WATER	X
645	"	09:10	46.0 EST	" "	X
TWQ-9D	4-11-94	11:50	76.0 EST	mud - No WATER	X
*TWQ-29A	4-13-94	14:00	62.2	Hand Bailed	1.2" + X
TWQ-106D	4-11-94	12:00	48.5 EST	No WATER	X
2-xx TWQ-141	"	13:20	200.2	AIR LIFT	10.0"
2-xx TWQ-142	"	12:34	210.7	" "	15.0"
1-xx TWQ-143	"	13:40	217.3	" "	13.0"
804	4-12-94	13:52	44.2	X	X
1-xx 805	"	13:55	46.6	X	X
1-xx 806	"	13:57	46.6	X	X
807	"	14:00	48.5	X	X
FIELD BLANK	X	X	X	X	X
RINSATE	X	X	X	X	X

X = very little water
 xx = WATER level up more THAN 1'
 x = " " Down " " "
 G.P. = GRAVEL PACK
 + = SANDY WATER

*-29A Bailed dry

GROUND WATER MONITORING FIELD DATA SHEET

SAMPLING

2nd QUARTER 19 94

Well No.	Month / Day	Time	Sampling Method	pH	Cond.	Temp. °C	Comments
501-B	X	X	X	X	X	X	
502-B	4-13-94	15:34	HAND BAILED	4.2	3,500	12.3	
504-B	"	15:21	" "	5.8	3,600	12.7	
509-D	4-12-94	14:09	" "	6.5	4,700	11.5	
515-A	"	14:38	" "	5.7	6,700	12.1	
516-A	"	15:03	" "	5.8	8,000	12.3	
517	4-13-94	10:16	" "	4.3	4,900	11.6	
518	"	15:48	" "	3.8	4,300	12.5	
604	4-12-94	14:49	" "	4.4	4,800	12.1	
614	"	14:23	" "	6.6	7,000	12.2	
619	"	15:15	" "	6.6	3,500	12.7	
624	"	13:24	" "	7.1	3,600	11.8	
627	4-13-94	13:52	" "	7.0	4,000	12.8	
632	4-14-94	09:54	" "	6.4	4,900	11.8	
* 639	4-13-94	14:47	" "	6.7	2,500	12.3	
642	"	15:07	" "	7.1	3,300	12.2	
644	X	X	X	X	X	X	
645	X	X	X	X	X	X	
TWQ-9D	X	X	X	X	X	X	
* TWQ-29A	4-14-94	14:08	HAND BAILED	7.2	3,400	12.3	
TWQ-106D	X	X	X	X	X	X	
TWQ-141	4-13-94	11:02	HAND BAILED	7.7	1,300	12.4	
TWQ-142	"	11:23	" "	7.9	1,200	12.8	
TWQ-143	"	11:41	" "	7.8	1,100	12.9	
801	4-12-94	13:00	pumped	6.4	7,000	12.1	
802	"	12:45	"	6.3	6,300	12.3	
803	"	12:33	"	6.5	5,000	12.2	
FIELD BLANK	4-13-94	10:45	X	7.3	70	10.8	
RINSATE	"	10:38	X	7.1	120	10.8	

* 639 - Bailed dry to sample .8 gal.
 * 29-A " " " .9 gal.

EPA WELLS

2nd Quarter 19 94

Date	Well No.	HP	Elevation T.O.P.	Meter Reading Start (-)	Meter Reading End	= Gals. Purged	Time for Well to Go Dry Minutes/Second
4-18-94	EPA-1	1/2	7035.544	44,929.7	44,936.6	6.9	1 123
4-18-94	EPA-2	1/3	7019.485	44,678.6	44,700.9	22.3	5 16
4-18-94	EPA-3	1/3	7019.070	XXXXXX	XXXXXX	X	XXXXXX
4-18-94	EPA-4	1/2	7069.798	44,838.8	44,906.5	67.7	10 149
4-18-94	EPA-5	1/3	7011.444	44,626.8	44,678.6	51.8	7 131
4-18-94	EPA-7	1/3	7011.662	PUMPING		X	XXXXXX
4-18-94	EPA-8	1/2	7076.402	44,741.6	44,826.9	85.3	21 130
4-18-94	EPA-9	1/3	7076.612	44,826.9	44,838.8	11.9	2 112
4-18-94	EPA-12	1/3	7029.215	XXXXXX	XXXXXX	X	XXXXXX
4-18-94	EPA-13	1/2	7030.467	44,909.6	44,929.7	20.1	2 121
4-19-94	EPA-14	1/2	6965.611	45,204.0	45,492.0	288.0	22 16
1-18-94	EPA-15	5-30	7002.932	44,700.9	44,741.6	40.7	3 140
4-18-94	EPA-17	X	7072.495	XXXXXX	XXXXXX	X	XXXXXX
1-18-94	EPA-18	1/3	7046.716	44,906.5	44,909.6	3.1	- 157
4-18-94	EPA-22A	1/2	6954.512	44,580.4	44,597.8	17.4	1 110
4-19-94	EPA-23	2	6926.312	44,936.6	45,204.0	267.4	18 155
*4-20-94	EPA-25	1/2	6903.383	45,492.0	45,566.5	FST. 150 Gal	29 11
4-18-94	EPA-27	1/3	6910.946	44,597.8	44,600.6	2.8	1 22
11	EPA-28	1	6917.861	44,600.6	44,626.8	26.2	1 142

* EPA 25 Plugs Flowmeter with SAND.



ENERGY LABORATORIES, INC.

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**UNC MINING AND MILLING: CHURCHROCK OPERATIONS
 GROUNDWATER MONITORING PROGRAM**

WELL NUMBER: Field Blank
 LAB I.D.: 94-0211
 SAMPLE DATE: 01-05-94
 REPORT DATE: 02-07-94
 QUARTER REPRESENTED: First
 UNC SUBMITTAL #: TE-1-1-94

MAJOR IONS:		ANALYTICAL RESULT	L.L.D.	UNITS	GROUNDWATER PROTECTION STANDARDS	
					NRC	ARAR
Calcium	(Ca)	1.1	0.05	mg/l		
Magnesium	(Mg)	0.2	0.01	mg/l		
Sodium	(Na)	14.0	0.05	mg/l		
Potassium	(K)	<0.1	0.10	mg/l		
Carbonate	(CO ₃)		0.10	mg/l		
Bicarbonate	(HCO ₃)	22.8	0.10	mg/l		
Sulfate	(SO ₄)	6.2	1.0	mg/l		2160
Chloride	(Cl)	7.9	0.10	mg/l		250
Ammonium as N	(NH ₄)	<0.05	0.05	mg/l		
Nitrate as N	(NO ₃)	0.13	0.10	mg/l		30.0
Dissolved Solids @ 180 C	(TDS)	46.0	1	mg/l		3170
pH	(units)	6.13	1-14	s.u.		
TRACE METALS:						
Aluminum	(Al)	<0.10	0.10	mg/l		5.0
Arsenic	(As)	<0.001	0.001	mg/l	0.05	0.05
Beryllium	(Be)	<0.010	0.010	mg/l	0.05	0.017
Cadmium	(Cd)	<0.01	0.01	mg/l	0.01	0.01
Cobalt	(Co)	<0.01	0.01	mg/l		0.05
Lead	(Pb)	<0.05	0.05	mg/l	0.05	0.05
Manganese	(Mn)	<0.01	0.01	mg/l		2.6
Molybdenum	(Mo)	<0.10	0.10	mg/l		1.0
Nickel	(Ni)	<0.05	0.05	mg/l	0.05	0.2
Selenium IV	(Se)	<0.001	0.001	mg/l	0.01	0.01
Vanadium	(V)	<0.10	0.10	mg/l	0.10	0.70
RADIOMETRIC:						
Uranium	(U)	<0.0003	0.0003	mg/l	0.30	5.0
Radium-226	(Ra226)	0.3	0.2	pCi/l	5.0*	5.0*
Ra-226 precision +/-		0.1		pCi/l		
Radium-228	(Ra228)	<1.0	1.0	pCi/l	5.0*	5.0*
Ra-228 precision				pCi/l		
Thorium-230	(Th230)	<0.2	0.2	pCi/l	5.0	15.0
Th-230 precision +/-				pCi/l		
Lead-210	(Pb210)	<1.0	1.0	pCi/l	1.0	
Pb-210 precision +/-				pCi/l		
Gross Alpha - U-nat and Rn-222		<1.0	1.0	pCi/l	15.0	
Gross Alpha precision +/-				pCi/l		

* Radium protection standards refer to combined Ra-226 and Ra-228

TRACE ORGANIC:
 Chloroform 3.4 1.0 ug/l 1.0

Report Approved by: *AB Res*

kmk



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**UNC MINING AND MILLING: CHURCHROCK OPERATIONS
 GROUNDWATER MONITORING PROGRAM**

WELL NUMBER: Field Blank
 LAB I.D.: 94-9812
 SAMPLE DATE: 04-13-94
 REPORT DATE: 05-22-94
 QUARTER REPRESENTED: Second
 UNC SUBMITTAL #: TE-5-4-94

MAJOR IONS:		ANALYTICAL RESULT	L.L.D.	UNITS	NRC	GROUNDWATER PROTECTION STANDARDS ARAR
Calcium	(Ca)	2.1	0.05	mg/l		
Magnesium	(Mg)	0.2	0.01	mg/l		
Sodium	(Na)	15.5	0.05	mg/l		
Potassium	(K)	<0.1	0.10	mg/l		
Carbonate	(CO3)		0.10	mg/l		
Bicarbonate	(HCO3)	22.0	0.10	mg/l		
Sulfate	(SO4)	15.5	1.0	mg/l		2160
Chloride	(Cl)	3.7	0.10	mg/l		250
Ammonium as N	(NH4)	<0.05	0.05	mg/l		
Nitrate as N	(NO3)	<0.10	0.10	mg/l		30.0
Dissolved Solids @ 180 C	(TDS)	50.0	1	mg/l		3170
pH	(units)	7.44	1-14	s.u.		
TRACE METALS:						
Aluminum	(Al)	<0.10	0.10	mg/l		5.0
Arsenic	(As)	<0.001	0.001	mg/l	0.05	0.05
Beryllium	(Be)	<0.010	0.010	mg/l	0.05	0.017
Cadmium	(Cd)	<0.01	0.01	mg/l	0.01	0.01
Cobalt	(Co)	<0.01	0.01	mg/l		0.05
Lead	(Pb)	<0.05	0.05	mg/l	0.05	0.05
Manganese	(Mn)	<0.01	0.01	mg/l		2.6
Molybdenum	(Mo)	<0.10	0.10	mg/l		1.0
Nickel	(Ni)	<0.05	0.05	mg/l	0.05	0.2
Selenium IV	(Se)	<0.001	0.001	mg/l	0.01	0.01
Vanadium	(V)	<0.10	0.10	mg/l	0.10	0.70
RADIOMETRIC:						
Uranium	(U)	<0.0003	0.0003	mg/l	0.30	5.0
Radium-226	(Ra226)	0.3	0.2	ppCi/l	5.0*	5.0*
Ra-226 precision +/-		0.3		ppCi/l		
Radium-228	(Ra228)	<1.0	1.0	ppCi/l	5.0*	5.0*
Ra-228 precision				ppCi/l		
Thorium-230	(Th230)	<0.2	0.2	ppCi/l	5.0	15.0
Th-230 precision +/-				ppCi/l		
Lead-210	(Pb210)	1.1	1.0	ppCi/l	1.0	
Pb-210 precision +/-		1.0		ppCi/l		
Gross Alpha - U-nat and Rn-222		<1.0	1.0	ppCi/l	15.0	
Gross Alpha precision +/-				ppCi/l		

* Radium protection standards refer to combined Ra-226 and Ra-228

TRACE ORGANIC:
 Chloroform 2.7 1.0 ug/l 1.0

Report Approved by: *P.A. Leasing*
 kmk



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**UNC MINING AND MILLING: CHURCHROCK OPERATIONS
 GROUNDWATER MONITORING PROGRAM**

WELL NUMBER: Rinsate
 LAB I.D.: 94-0210
 SAMPLE DATE: 01-05-94
 REPORT DATE: 02-07-94
 QUARTER REPRESENTED: First
 UNC SUBMITTAL #: TE-1-1-94

MAJOR IONS:		ANALYTICAL RESULT	L.L.D.	UNITS	NRC	GROUNDWATER PROTECTION STANDARDS ARAR
Calcium	(Ca)	6.6	0.05	mg/l		
Magnesium	(Mg)	2.3	0.01	mg/l		
Sodium	(Na)	14.3	0.05	mg/l		
Potassium	(K)	<0.1	0.10	mg/l		
Carbonate	(CO3)		0.10	mg/l		
Bicarbonate	(HCO3)	22.9	0.10	mg/l		
Sulfate	(SO4)	31.6	1.0	mg/l		2160
Chloride	(Cl)	7.3	0.10	mg/l		250
Ammonium as N	(NH4)	<0.05	0.05	mg/l		
Nitrate as N	(NO3)	<0.10	0.10	mg/l		30.0
Dissolved Solids @ 180 C	(TDS)	73.0	1	mg/l		3170
pH	(units)	6.13	1-14	s.u.		
TRACE METALS:						
Aluminum	(Al)	<0.10	0.10	mg/l		5.0
Arsenic	(As)	<0.001	0.001	mg/l	0.05	0.05
Beryllium	(Be)	<0.010	0.010	mg/l	0.05	0.017
Cadmium	(Cd)	<0.01	0.01	mg/l	0.01	0.01
Cobalt	(Co)	<0.01	0.01	mg/l		0.05
Lead	(Pb)	<0.05	0.05	mg/l	0.05	0.05
Manganese	(Mn)	0.05	0.01	mg/l		2.6
Molybdenum	(Mo)	<0.10	0.10	mg/l		1.0
Nickel	(Ni)	<0.05	0.05	mg/l	0.05	0.2
Selenium IV	(Se)	<0.001	0.001	mg/l	0.01	0.01
Vanadium	(V)	<0.10	0.10	mg/l	0.10	0.70
RADIOMETRIC:						
Uranium	(U)	<0.0003	0.0003	mg/l	0.30	5.0
Radium-226	(Ra226)	0.4	0.2	pCi/l	5.0*	5.0*
Ra-226 precision +/-		0.2		pCi/l		
Radium-228	(Ra228)	<1.0	1.0	pCi/l	5.0*	5.0*
Ra-228 precision				pCi/l		
Thorium-230	(Th230)	<0.2	0.2	pCi/l	5.0	15.0
Th-230 precision +/-				pCi/l		
Lead-210	(Pb210)	<1.0	1.0	pCi/l	1.0	
Pb-210 precision +/-				pCi/l		
Gross Alpha - U-nat and Rn-222		<1.0	1.0	pCi/l	15.0	
Gross Alpha precision +/-				pCi/l		

* Radium protection standards refer to combined Ra-226 and Ra-228

TRACE ORGANIC:

Chloroform <1.0 1.0 ug/l 1.0

Report Approved by: *DB Lea*

kuk



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**UNC MINING AND MILLING: CHURCHROCK OPERATIONS
 GROUNDWATER MONITORING PROGRAM**

WELL NUMBER: Rinsate
 LAB I.D.: 94-9811
 SAMPLE DATE: 04-13-94
 REPORT DATE: 05-22-94
 QUARTER REPRESENTED: Second
 UNC SUBMITTAL #: TE-5-4-94

MAJOR IONS:		ANALYTICAL RESULT	L.L.D.	UNITS	GROUNDWATER PROTECTION STANDARDS	
					NRC	ARAR
Calcium	(Ca)	4.3	0.05	mg/l		
Magnesium	(Mg)	1.8	0.01	mg/l		
Sodium	(Na)	17.3	0.05	mg/l		
Potassium	(K)	<0.1	0.10	mg/l		
Carbonate	(CO3)		0.10	mg/l		
Bicarbonate	(HCO3)	27.0	0.10	mg/l		2160
Sulfate	(SO4)	29.7	1.0	mg/l		250
Chloride	(Cl)	5.1	0.10	mg/l		
Ammonium as N	(NH4)	<0.05	0.05	mg/l		30.0
Nitrate as N	(NO3)	0.75	0.10	mg/l		3170
Dissolved Solids @ 180 C	(TDS)	73.0	1	mg/l		
pH	(units)	7.10	1-14	s.u.		
TRACE METALS:						
Aluminum	(Al)	<0.10	0.10	mg/l		5.0
Arsenic	(As)	<0.001	0.001	mg/l	0.05	0.05
Beryllium	(Be)	<0.010	0.010	mg/l	0.05	0.017
Cadmium	(Cd)	<0.01	0.01	mg/l	0.01	0.01
Cobalt	(Co)	<0.01	0.01	mg/l		0.05
Lead	(Pb)	<0.05	0.05	mg/l	0.05	0.05
Manganese	(Mn)	<0.01	0.01	mg/l		2.6
Molybdenum	(Mo)	<0.10	0.10	mg/l		1.0
Nickel	(Ni)	<0.05	0.05	mg/l	0.05	0.2
Selenium IV	(Se)	<0.001	0.001	mg/l	0.01	0.01
Vanadium	(V)	<0.10	0.10	mg/l	0.10	0.70
RADIOMETRIC:						
Uranium	(U)	0.001	0.0003	mg/l	0.30	5.0
Radium-226	(Ra226)	<0.2	0.2	pCi/l	5.0*	5.0*
Ra-226 precision +/-				pCi/l		
Radium-228	(Ra228)	<1.0	1.0	pCi/l	5.0*	5.0*
Ra-228 precision				pCi/l		
Thorium-230	(Th230)	<0.2	0.2	pCi/l	5.0	15.0
Th-230 precision +/-				pCi/l		
Lead-210	(Pb210)	<1.0	1.0	pCi/l	1.0	
Pb-210 precision +/-				pCi/l		
Gross Alpha - U-nat and Rn-222		<1.0	1.0	pCi/l	15.0	
Gross Alpha precision +/-				pCi/l		

* Radium protection standards refer to combined Ra-226 and Ra-228

TRACE ORGANIC:
 Chloroform 2.0 1.0 ug/l 1.0

Report Approved by: *P.A. Leasing*

kmk

APPENDIX B

Chain of Custody Forms

UNITED NUCLEAR CORPORATION
 (State Road 566 - 2 1/2 Miles NE of Gallup)
 P.O. Box 3077
 Gallup, NM 87305-3077
 505-722-6651

CHAIN OF CUSTODY

Energy Laboratories, Inc.
 Laboratory

254 North Center Street
 Address

Casper WY 82601
 City State Zip

307-235-0515
 Phone No.

All analysis will be performed in accordance with EPA approved procedures and/or 15th Edition of Standard Methods

UNC Submittal No. TE- 1-1-94

Sample Description	Date	Time	Filter 0.45u	PRESERVATION					Preserved By	Analysis Required (For all samples listed)
				plain	HNO ₃	H ₂ SO ₄	Na ₂ S ₂ O ₃	NaOH		
A 639	1-5-94	10:16	✓ CD	✓ 7.7	✓ CD	✓ CD	✓ 7.7	✓	CD	As, Be, Ca, Cd, Cl, HCO ₃
A 642	"	10:28	✓	✓	✓	✓	✓	✓	✓	K, Mg, Mn, Na, NH ₃ , Ni,
1 141	"	10:18	✓	✓	✓	✓	✓	✓	✓	NO ₃ , Pb, Pb-210, pH, Se,
3 411	"	11:06	✓	✓	✓	✓	✓	✓	✓	SO ₄ , TDS, Th-230, U, V,
1 142	"	11:18	✓	✓	✓	✓	✓	✓	✓	Chloroform, Gross
1 143	"	11:33	✓	✓	✓	✓	✓	✓	✓	Alpha (-) U & Rn,
3 504B	"	11:52	✓	✓	✓	✓	✓	✓	✓	Combined Ra-226 & Ra-228, Al,
3 420	"	12:14	✓	✓	✓	✓	✓	✓	✓	Co, Mo
1 RINSATE	"	12:24	✓	✓	✓	✓	✓	✓	✓	
1 FIELD BLANK	"	12:32	✓ CD	✓	✓	✓	✓	✓	CD	Wells CW-3 and CW-4 require
3 517	"	14:03	✓	✓	✓	✓	✓	✓	✓	Po analysis in addition to above.
3 502-B	"	14:36	✓	✓	✓	✓	✓	✓	✓	
3 518	"	14:47	✓	✓ 7.7	✓	✓	✓ 7.7	✓	CD	

Sampled by: Mary S. Hall
 Dispatched by: M. McBride
 Carrier: UPS
 Method of Shipment: 2 coolers

Received by: C. Snow
 Date: 1-6-94 Time: 3:17 PM.

Date: 1-6-94 Time: 9:40 AM
 Lab Receipt Signature: Marty Glenn
 Date: 1/6/94 Time: 1330

The above analysis to be performed is authorized by:
 Signature: [Signature]
 Date: 1/6/94

UNITED NUCLEAR CORPORATION
 (State Road 566 - 21 Miles NE of Gallup)
 P.O. Box 3077
 Gallup, NM 87305-3077
 505-722-6651

CHAIN OF CUSTODY

Energy Laboratories, Inc.
 Laboratory

254 North Center Street
 Address

Casper WY 82601
 City State Zip

307-235-0515
 Phone No.

All analysis will be performed in accordance with EPA approved procedures and/or 15th Edition of Standard Methods

page 1 of 2 pages

UNC Submittal No. TE- 2-1-94

Sample Description	Date	Time	Filter 0.45u	PRESERVATION					Preserved By	Analysis Required (For all samples listed)	
				plain	HNO ₃	H ₂ SO ₄	Na ₂ S ₂ O ₃	NaOH			
GW-4	1-6-94	08:46	✓	✓ H ₂ H	✓	✓	✓ H ₂ H	✓	CD	As, Be, Ca, Cd, Cl, ⁶⁰ Co, ⁹⁰ Sr, ¹³⁷ Cs, ²²⁶ Ra, ²³² Th, ²³⁸ U, ²⁴⁰ Pu, ²⁴¹ Am, ²⁴² Cm, ²⁴³ Cm, ²⁴⁴ Cm, ²⁴⁵ Cm, ²⁴⁶ Cm, ²⁴⁷ Cm, ²⁴⁸ Cm, ²⁴⁹ Cm, ²⁵⁰ Cm, ²⁵¹ Cm, ²⁵² Cm, ²⁵³ Cm, ²⁵⁴ Cm, ²⁵⁵ Cm, ²⁵⁶ Cm, ²⁵⁷ Cm, ²⁵⁸ Cm, ²⁵⁹ Cm, ²⁶⁰ Cm, ²⁶¹ Cm, ²⁶² Cm, ²⁶³ Cm, ²⁶⁴ Cm, ²⁶⁵ Cm, ²⁶⁶ Cm, ²⁶⁷ Cm, ²⁶⁸ Cm, ²⁶⁹ Cm, ²⁷⁰ Cm, ²⁷¹ Cm, ²⁷² Cm, ²⁷³ Cm, ²⁷⁴ Cm, ²⁷⁵ Cm, ²⁷⁶ Cm, ²⁷⁷ Cm, ²⁷⁸ Cm, ²⁷⁹ Cm, ²⁸⁰ Cm, ²⁸¹ Cm, ²⁸² Cm, ²⁸³ Cm, ²⁸⁴ Cm, ²⁸⁵ Cm, ²⁸⁶ Cm, ²⁸⁷ Cm, ²⁸⁸ Cm, ²⁸⁹ Cm, ²⁹⁰ Cm, ²⁹¹ Cm, ²⁹² Cm, ²⁹³ Cm, ²⁹⁴ Cm, ²⁹⁵ Cm, ²⁹⁶ Cm, ²⁹⁷ Cm, ²⁹⁸ Cm, ²⁹⁹ Cm, ³⁰⁰ Cm, ³⁰¹ Cm, ³⁰² Cm, ³⁰³ Cm, ³⁰⁴ Cm, ³⁰⁵ Cm, ³⁰⁶ Cm, ³⁰⁷ Cm, ³⁰⁸ Cm, ³⁰⁹ Cm, ³¹⁰ Cm, ³¹¹ Cm, ³¹² Cm, ³¹³ Cm, ³¹⁴ Cm, ³¹⁵ Cm, ³¹⁶ Cm, ³¹⁷ Cm, ³¹⁸ Cm, ³¹⁹ Cm, ³²⁰ Cm, ³²¹ Cm, ³²² Cm, ³²³ Cm, ³²⁴ Cm, ³²⁵ Cm, ³²⁶ Cm, ³²⁷ Cm, ³²⁸ Cm, ³²⁹ Cm, ³³⁰ Cm, ³³¹ Cm, ³³² Cm, ³³³ Cm, ³³⁴ Cm, ³³⁵ Cm, ³³⁶ Cm, ³³⁷ Cm, ³³⁸ Cm, ³³⁹ Cm, ³⁴⁰ Cm, ³⁴¹ Cm, ³⁴² Cm, ³⁴³ Cm, ³⁴⁴ Cm, ³⁴⁵ Cm, ³⁴⁶ Cm, ³⁴⁷ Cm, ³⁴⁸ Cm, ³⁴⁹ Cm, ³⁵⁰ Cm, ³⁵¹ Cm, ³⁵² Cm, ³⁵³ Cm, ³⁵⁴ Cm, ³⁵⁵ Cm, ³⁵⁶ Cm, ³⁵⁷ Cm, ³⁵⁸ Cm, ³⁵⁹ Cm, ³⁶⁰ Cm, ³⁶¹ Cm, ³⁶² Cm, ³⁶³ Cm, ³⁶⁴ Cm, ³⁶⁵ Cm, ³⁶⁶ Cm, ³⁶⁷ Cm, ³⁶⁸ Cm, ³⁶⁹ Cm, ³⁷⁰ Cm, ³⁷¹ Cm, ³⁷² Cm, ³⁷³ Cm, ³⁷⁴ Cm, ³⁷⁵ Cm, ³⁷⁶ Cm, ³⁷⁷ Cm, ³⁷⁸ Cm, ³⁷⁹ Cm, ³⁸⁰ Cm, ³⁸¹ Cm, ³⁸² Cm, ³⁸³ Cm, ³⁸⁴ Cm, ³⁸⁵ Cm, ³⁸⁶ Cm, ³⁸⁷ Cm, ³⁸⁸ Cm, ³⁸⁹ Cm, ³⁹⁰ Cm, ³⁹¹ Cm, ³⁹² Cm, ³⁹³ Cm, ³⁹⁴ Cm, ³⁹⁵ Cm, ³⁹⁶ Cm, ³⁹⁷ Cm, ³⁹⁸ Cm, ³⁹⁹ Cm, ⁴⁰⁰ Cm, ⁴⁰¹ Cm, ⁴⁰² Cm, ⁴⁰³ Cm, ⁴⁰⁴ Cm, ⁴⁰⁵ Cm, ⁴⁰⁶ Cm, ⁴⁰⁷ Cm, ⁴⁰⁸ Cm, ⁴⁰⁹ Cm, ⁴¹⁰ Cm, ⁴¹¹ Cm, ⁴¹² Cm, ⁴¹³ Cm, ⁴¹⁴ Cm, ⁴¹⁵ Cm, ⁴¹⁶ Cm, ⁴¹⁷ Cm, ⁴¹⁸ Cm, ⁴¹⁹ Cm, ⁴²⁰ Cm, ⁴²¹ Cm, ⁴²² Cm, ⁴²³ Cm, ⁴²⁴ Cm, ⁴²⁵ Cm, ⁴²⁶ Cm, ⁴²⁷ Cm, ⁴²⁸ Cm, ⁴²⁹ Cm, ⁴³⁰ Cm, ⁴³¹ Cm, ⁴³² Cm, ⁴³³ Cm, ⁴³⁴ Cm, ⁴³⁵ Cm, ⁴³⁶ Cm, ⁴³⁷ Cm, ⁴³⁸ Cm, ⁴³⁹ Cm, ⁴⁴⁰ Cm, ⁴⁴¹ Cm, ⁴⁴² Cm, ⁴⁴³ Cm, ⁴⁴⁴ Cm, ⁴⁴⁵ Cm, ⁴⁴⁶ Cm, ⁴⁴⁷ Cm, ⁴⁴⁸ Cm, ⁴⁴⁹ Cm, ⁴⁵⁰ Cm, ⁴⁵¹ Cm, ⁴⁵² Cm, ⁴⁵³ Cm, ⁴⁵⁴ Cm, ⁴⁵⁵ Cm, ⁴⁵⁶ Cm, ⁴⁵⁷ Cm, ⁴⁵⁸ Cm, ⁴⁵⁹ Cm, ⁴⁶⁰ Cm, ⁴⁶¹ Cm, ⁴⁶² Cm, ⁴⁶³ Cm, ⁴⁶⁴ Cm, ⁴⁶⁵ Cm, ⁴⁶⁶ Cm, ⁴⁶⁷ Cm, ⁴⁶⁸ Cm, ⁴⁶⁹ Cm, ⁴⁷⁰ Cm, ⁴⁷¹ Cm, ⁴⁷² Cm, ⁴⁷³ Cm, ⁴⁷⁴ Cm, ⁴⁷⁵ Cm, 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614	"	09:08	✓	✓	✓	✓	✓	✓	CD	K, Mg, Mn, Na, NH ₃ , Ni,	
515-A	"	09:22	✓	✓	✓	✓	✓	✓		NO ₃ , Pb, Pb-210, pH, Se,	
604	"	09:35	✓	✓	✓	✓	✓	✓		SO ₄ , TDS, Th-230, U, V,	
515A	"	09:51	✓	✓	✓	✓	✓	✓		Chloroform, Gross	
619	"	10:04	✓	✓	✓	✓	✓	✓		Alpha (-) U & Rn,	
EPA#7	"	10:14	✓	✓	✓	✓	✓	✓		Combined Ra-226 & Ra-228, Al,	
GW-1	"	11:12	✓	✓	✓	✓	✓	✓		Co, Mo	
624	"	11:18	✓	✓	✓	✓	✓	✓			
GW-2	"	11:36	✓	✓	✓	✓	✓	✓		Wells GW-3 and GW-4 require	
632	"	11:48	✓	✓	✓	✓	✓	✓		Po analysis in addition to above.	
801	"	11:57	✓	✓	✓	✓	✓	✓			
802	"	12:03	✓	✓	✓	✓	✓	✓			
803	"	12:12	✓	✓	✓	✓	✓	✓			
509-D	"	12:22	✓	✓ H ₂ H	✓	✓	✓ H ₂ H	✓	CD		

Sampled by: Harold Holt Received by: C. Dixon
 Dispatched by: M. McBride Date: 1-7-94 Time: _____
 Carrier: UPS

Date: 1-7-94 Time: _____
Marty Glenn
 Lab Receipt Signature
 Date: 1/7/94 Time: 1300

The above analysis to be performed is authorized by:
[Signature]
 Signature
 Date: 1/7/94

Method of Shipment: _____

UNITED NUCLEAR CORPORATION
 (State Road 566 - 21 Miles NE of Gallup)
 P.O. Box 3077
 Gallup, NM 87305-3077
 505-722-6651

CHAIN OF CUSTODY

Energy Laboratories, Inc.
 Laboratory

254 North Center Street
 Address

Casper WY 82601
 City State Zip

307-235-0515
 Phone No.

All analysis will be performed in accordance with EPA approved procedures and/or 15th Edition of Standard Methods

Page 2 of 2 pages

UNC Submittal No. TE-2-1-94

Sample Description	Date	Time	Filter 0.45u	PRESERVATION					Preserved By	Analysis Required (For all samples listed)
				plain	HNO ₃	H ₂ SO ₄	Na ₂ S ₂ O ₃	NaOH		
29-A	1-6-94	13:48	✓	✓ H.H.	✓	✓	✓ H.H.	✓	CD	As, Be, Ca, Cd, Cl, HCO ₃
GW-3	"	14:04	✓	✓ H.H.	✓	✓	✓ H.H.	✓	CD	K, Mg, Mn, Na, NH ₃ , Ni,
627	"	14:26	✓	✓ H.H.	✓	✓	✓ H.H.	✓	CD	NO ₃ , Pb, Pb-210, pH, Se, SO ₄ , TDS, Th-230, U, V, Chloroform, Gross Alpha (-) U & Rn, Combined Ra-226 & Ra-228, Al, Co, Mo
										Wells GW-3 and GW-4 require Po analysis in addition to above.

Sampled by: Harry S. Hall Received by: C. Dixon
 Dispatched by: AP McBride Date: 1-7-94 Time: _____
 Carrier: UPS
 Method of Shipment: _____

1-7-94
 Date Time
Marty Glenn
 Lab Receipt Signature
11 Jan 94 1300
 Date Time

The above analysis to be performed is authorized by:
ED [Signature]
 Signature
1/7/94
 Date

UNITED NUCLEAR CORPORATION
 (State Road 566 - 21 Miles NE of Gallup)
 P.O. Box 3077
 Gallup, NM 87305-3077
 505-722-6651

CHAIN OF CUSTODY

Energy Laboratories, Inc.
 Laboratory

254 North Center Street
 Address

Casper WY 82601
 City State Zip

307-235-0515
 Phone No.

All analysis will be performed in accordance with EPA approved procedures and/or 15th Edition of Standard Methods

UNC Submittal No. TE-3-1-94

Sample Description	Date	Time	Filter 0.45u	PRESERVATION					Preserved By	Analysis Required (For all samples listed)
				plain	HNO ₃	H ₂ SO ₄	Na ₂ S ₂ O ₃	NaOH		
4 EPA # 23	1-10-94	14:38	✓	✓ H.H.	✓	✓	✓ H.H.	✓	CP	As, Be, Ca, Cd, Cl, HCO ₃
4 EPA # 25	"	15:35	✓	✓	✓	✓	✓		}	K, Mg, Mn, Na, NH ₃ , Ni,
3 EPA # 14	"	08:52	✓	✓	✓	✓	✓			NO ₂ , Pb, Pb-210, pH, Se,
3 EPA # 1	1-11-94	09:14	✓	✓	✓	✓	✓			SO ₄ , TDS, Th-230, U, V,
3 EPA # 13	"	09:35	✓	✓	✓	✓	✓			Chloroform, Gross
3 EPA # 18	"	09:57	✓	✓	✓	✓	✓			Alpha (-) U & Rn,
1 EPA # 8	"	10:12	✓	✓	✓	✓	✓			Combined Ra-226 & Ra-228, Al,
1 EPA # 4	"	10:38	✓	✓	✓	✓	✓			Co, Mo
1 EPA # 5	"	10:59	✓	✓	✓	✓	✓			
3 EPA # 15	"	11:20	✓	✓	✓	✓	✓			Wells CW-3 and CW-4 require
1 EPA # 2	"	11:54	✓	✓	✓	✓	✓			Po analysis in addition to above.
AEPA #22A	"	13:55	✓	✓	✓	✓	✓			
AEPA #27	"	14:12	✓	✓	✓	✓	✓			
AEPA #28	"	14:23	✓	✓	✓	✓	✓			
3 EPA #9	1-12-94	13:38	✓	✓ H.H.	✓	✓	✓ H.H.		CD	

Sampled by: Hary Hall
 Dispatched by: A. R. B. B. B.
 Carrier: UPS
 Method of Shipment: 2 coolers

Received by: C. J. J.
 Date: 1-12-94 Time: 3:05 PM.

Date: 1-12-94 Time: 2:00 PM
 Lab Receipt Signature: Marty Glenn
 Date: 14 Jan 94 Time: 1300

The above analysis to be performed is authorized by:
 Signature: Ed M. M.
 Date: 1/12/94

UNITED NUCLEAR CORPORATION
 (State Road 566 - 21 Miles NE of Gallup)
 P.O. Box 3077
 Gallup, NM 87305-3077
 505-722-6651

CHAIN OF CUSTODY

Energy Laboratories, Inc.
 Laboratory

254 North Center Street
 Address

Casper WY 82601
 City State Zip

307-235-0515
 Phone No.

All analysis will be performed in accordance with EPA approved procedures and/or 15th Edition of Standard Methods

UNC Submittal No. TE- 4-4-94

Sample Description	Date	Time	Filter 0.45u	PRESERVATION					Preserved By	Analysis Required (For all samples listed)
				plain	HNO ₃	H ₂ SO ₄	Na ₂ S ₂ O ₃	NaOH		
A GW-1	4-12-94	13:11	✓	✓ H/H	✓	✓	✓ H/H		C. D	As, Be, Ca, Cd, Cl, HCO ₃
A 624	"	13:24	✓	✓	✓	✓	✓			K, Mg, Mn, Na, NH ₃ , Ni,
A GW-2	"	13:43	✓	✓	✓	✓	✓			NO ₃ , Pb, Pb-210, pH, Se,
803	"	12:33	✓	✓	✓	✓	✓			SO ₄ , TDS, Th-230, U, V,
802	"	12:45	✓	✓	✓	✓	✓			Chloroform, Gross
801	"	13:00	✓	✓	✓	✓	✓		C. D	Alpha (-) U & Rn,
609-D	"	14:09	✓	✓	✓	✓	✓		MC	Combined Ra-226 & Ra-228, Al,
614	"	14:23	✓	✓	✓	✓	✓			Co, Mo
515-A	"	14:38	✓	✓	✓	✓	✓			
604	"	14:49	✓	✓	✓	✓	✓			Wells GW-3 and GW-4 require
516-A	"	15:03	✓	✓	✓	✓	✓			Po analysis in addition to above.
619	"	15:15	✓	✓	✓	✓	✓			
✓ EPA #7	"	15:28	✓	✓ H/H			✓ H/H		MC	

Sampled by: Hary Hall Received by: Ced Dixon
 Dispatched by: A. McFie 4-13-94 2:35 PM
 Date Time
 Carrier: UPS
 Method of Shipment: 2 iced coolers

4-13-94 12:10 PM
 Date Time
Marty Glenn
 Lab Receipt Signature
 15 April 94 1345
 Date Time

The above analysis to be performed is authorized by:
Ed Moul
 Signature
 4/13/94
 Date

UNITED NUCLEAR CORPORATION
 (State Road 566 - 21 Miles NE of Gallup)
 P.O. Box 3077
 Gallup, NM 87305-3077
 505-722-6651

CHAIN OF CUSTODY

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 Laboratory

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 Address

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 City State Zip

307-235-0515
 Phone No.

All analysis will be performed in accordance with EPA approved procedures and/or 15th Edition of Standard Methods

UNC Submittal No. TE-5-4-94

Sample Description	Date	Time	Filter 0.45u	PRESERVATION					Preserved By	Analysis Required (For all samples listed)
				plain	HNO ₃	H ₂ SO ₄	Na ₂ S ₂ O ₃	NaOH		
3 517	4-13-94	10:16	✓	✓ H ₂ A	✓	✓	✓ H ₂ A	✓	As, Be, Ca, Cd, Cl, HCO ₃ ,	
A GW-4	"	10:31	✓	✓	✓	✓	✓	✓	K, Mg, Mn, Na, NH ₃ , Ni,	
1 141	"	11:02	✓	✓	✓	✓	✓	✓	NO ₃ , Pb, Pb-210, pH, Se,	
1 142	"	11:23	✓	✓	✓	✓	✓	✓	SO ₄ , TDS, Th-230, U, V,	
1 143	"	11:41	✓	✓	✓	✓	✓	✓	Chloroform, Gross	
3 504-B	"	15:21	✓	✓	✓	✓	✓	✓	Alpha (-) U & Rn,	
3 502-B	"	15:34	✓	✓	✓	✓	✓	✓	Combined Ra-226 & Ra-228, Al,	
3 518	"	15:48	✓	✓	✓	✓	✓	✓	Co, Mo	
3 420	"	13:26	✓	✓	✓	✓	✓	✓	Wells CW-3 and CW-4 require	
A 627	"	13:52	✓	✓	✓	✓	✓	✓	Po analysis in addition to above.	
A GW-3	"	14:30	✓	✓	✓	✓	✓	✓		
1 RINSATE	"	10:38	✓	✓	✓	✓	✓	✓		
1 Field 3AK	"	10:45	✓	✓ H ₂ A	✓	✓	✓ H ₂ A	✓		
A 639	"	14:47	✓	✓ S	✓	✓	✓ S	✓		
A 642	"	15:07	✓	✓ S	✓	✓	✓ S	✓		

Sampled by: Harvey T. Hall
 Dispatched by: Don McBride
 Carrier: UPS
 Method of Shipment: 3 iced coolers

Received by: Max Chischilly
 Date: 4-14-94 Time: 2:55 PM

Date: 4-14-94 Time: 11:25 AM
 Lab Receipt Signature: Marty Glenn
 Date: 18 Apr 94 Time: 14:15

The above analysis to be performed is authorized by:
 Signature: [Signature]
 Date: 4/14/94

UNITED NUCLEAR CORPORATION
 (State Road 566 - 21 Miles NE of Gallup)
 P.O. Box 3077
 Gallup, NM 87305-3077
 505-722-6651

CHAIN OF CUSTODY

Energy Laboratories, Inc.
 Laboratory

254 North Center Street
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Casper WY 82601
 City State Zip

307-235-0515
 Phone No.

All analysis will be performed in accordance with EPA approved procedures and/or 15th Edition of Standard Methods

UNC Submittal No. TE- 7-4-94

Sample Description	Date	Time	Filter 0.45u	PRESERVATION					Preserved By	Analysis Required (For all samples listed)
				plain	HNO ₃	H ₂ SO ₄	Na ₂ S ₂ O ₃	NaOH		
EPA #22-A	4-19-94	09:16	✓	✓	✓	✓	✓		HA	As, Be, Ca, Cd, Cl, HCO ₃
EPA #23	"	09:42	✓	✓	✓	✓	✓		}	K, Mg, Mn, Na, NH ₃ , Ni,
EPA #27	"	10:18	✓	✓	✓	✓	✓			NO ₃ , Pb, Pb-210, pH, Se,
EPA #28	"	10:27	✓	✓	✓	✓	✓			SO ₄ , TDS, Th-230, U, V,
EPA #5	"	11:36	✓	✓	✓	✓	✓		HA	Chloroform, Gross
EPA #2	"	13:41	✓	✓	✓	✓	✓		}	Alpha (-) U & Rn,
EPA #15	"	14:01	✓	✓	✓	✓	✓			Combined Ra-226 & Ra-228, Al,
EPA #14	"	15:07	✓	✓	✓	✓	✓			HA
										Wells CW-3 and CW-4 require Po analysis in addition to above.

Sampled by: Harry S. Hall Received by: Harry S. Hall
 Dispatched by: M. McBride 4-20-94 2:40 PM
 Date Date Time
 Carrier: UPS
2 iced coolers
 Method of Shipment

4-20-94
 Date Time
Marty Glenn
 Lab Receipt Signature
 22 Apr 94 1400
 Date Time

The above analysis to be performed is authorized by:
Ed Waite
 Signature
 4/20/94
 Date

UNITED NUCLEAR CORPORATION
 (State Road 566 - 21 Miles NE of Gallup)
 P.O. Box 3077
 Gallup, NM 87305-3077
 505-722-6651

CHAIN OF CUSTODY

Energy Laboratories, Inc.
 Laboratory

254 North Center Street
 Address

Casper WY 82601
 City State Zip

307-235-0515
 Phone No.

All analysis will be performed in accordance with EPA approved procedures and/or 15th Edition of Standard Methods

UNC Submittal No. TE- 8-4-94

Sample Description	Date	Time	Filter 0.45u	PRESERVATION					Preserved By	Analysis Required (For all samples listed)
				plain	HNO ₃	H ₂ SO ₄	Na ₂ S ₂ O ₃	NaOH		
1 EPA # 8	4-20-94	10:20	✓	✓	✓	✓	✓		H.H.	As, Be, Ca, Cd, Cl, HCO ₃ ,
3 EPA # 9	"	10:29	✓	✓	✓	✓	✓		}	K, Mg, Mn, Na, NH ₃ , Ni,
1 EPA # 4	"	10:43	✓	✓	✓	✓	✓			NO ₃ , Pb, Pb-210, pH, Se,
3 EPA # 13	"	10:53	✓	✓	✓	✓	✓			SO ₄ , TDS, Th-230, U, V,
3 EPA # 13	"	11:07	✓	✓	✓	✓	✓			Chloroform, Gross
3 EPA # 1	"	11:23	✓	✓	✓	✓	✓			Alpha (-) U & Rn,
1 EPA # 25	"	14:53	✓	✓	✓	✓	✓		H.H.	Combined Ra-226 & Ra-228, Al, Co, Mo
										Wells CW-3 and CW-4 require Po analysis in addition to above.

Sampled by: Harry S. Hall
 Dispatched by: M. McBride
 Carrier: UPS
 Method of Shipment: 1 iced cooler

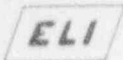
Received by: Harry S. Hall
 Date: 4-21-94
 Time: 3:00 PM

Date: 4-21-94 Time: _____
 Lab Receipt Signature: Marty Glenn
 Date: 25 Apr 94 Time: 1400

The above analysis to be performed is authorized by:
 Signature: Ed Mabe
 Date: 4/21/94

APPENDIX C

Laboratory Quality Control and Performance Reports



QUALITY ASSURANCE REPORT - UNC Mining & Milling

Report Date: 02-07-94
 Project: Chuckrock Operations
 ELI #(s): 94:0291-96

MAJOR IONS mg/l:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE SAMPLE ANALYZED
Calcium	EPA-200.7	100	-	93	-	PG	01-13-94
Magnesium	EPA-200.7	100	-	92	-	PG	01-13-94
Sodium	EPA-200.7	100	-	97	-	PG	01-13-94
Potassium	EPA-258.1	100	-	94	-	PG	01-13-94
Bicarbonate	EPA-310.1	100	-	-	-	DC	01-14-94
Sulfate	EPA-375.3	99	-	98	-	DC	01-21-94
Chloride	EPA-325.3	99	-	97	-	DC	01-19-94
Ammonium	EPA-350.1	100	-	98	-	DC	01-13-94
Nitrate	EPA-353.2	100	-	113	-	DC	01-12-94
TDS @ 180 C	EPA-160.1	100	-	-	-	RCB	01-13-94
pH (units)	EPA-150.1	100	-	-	-	DC	01-14-94
TRACE METALS mg/l:							
Aluminum	EPA-200.7	100	-	102	-	CP	01-26-94
Arsenic	EPA-206.3	100	-	105	-	PG	01-19-94
Cadmium	EPA-200.7	100	-	89	-	CP	01-26-94
Lead	EPA-239.2	90	-	96	-	CP	01-26-94
Manganese	EPA-200.7	102	-	103	-	CP	01-26-94
Molybdenum	EPA-200.7	100	-	93	-	CP	01-26-94
Nickel	EPA-200.7	100	-	90	-	CP	01-26-94
Selenium	EPA-270.3	100	-	104	-	CP	01-18-94
Vanadium	EPA-200.7	100	-	94	-	CP	01-26-94
Cobalt	EPA-200.7	100	-	89	-	CP	01-26-94
Beryllium	EPA-200.7	100	-	97	-	CP	01-26-94
ORGANICS:							
Chloroform	EPA-8260	101	-	102	-	CB	01-13-94
RADIOMETRIC:							
Uranium	EPA-908.1	102	-	101	-	DB	01-16-94
Ra226	EPA-903.0	120	-	130	-	DB	01-22-94
Lead 210	NERHL-65-4	102	-	-	-	DB	01-27-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	20.73	25.30	-4.57	DB	08-13-93
Ra226	EPA-903.1	15.23	14.90	0.33	DB	09-17-93
Ra228	EPA-904.1	16.13	20.40	-4.27	DB	09-17-93
Gross Alpha	EPA-900.0	16.00	20.00	-4.00	DB	10-29-93
Gross Beta	EPA-900.0	19.00	15.00	4.00	DB	10-29-93

Report Approved By: *DB Rea*



QUALITY ASSURANCE REPORT - UNC Mining & Milling
 Report Date: 02-11-94
 Project: Churchrock Operations
 ELI #(s): 94:0199-200

MAJOR IONS mg/l:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE SAMPLE ANALYZED
Calcium	EPA-200.7	99	-	93	-	CP	01-13-94
Magnesium	EPA-200.7	100	-	92	-	CP	01-13-94
Sodium	EPA-200.7	100	-	97	-	CP	01-13-94
Potassium	EPA-258.1	99	-	94	-	CP	01-13-94
Bicarbonate	EPA-310.1	100	-	96	-	DC	01-20-94
Sulfate	EPA-375.3	100	-	-	-	DC	01-21-94
Ammonium	EPA-350.1	102	-	102	-	DC	01-13-94
Nitrate	EPA-353.2	100	-	113	-	DC	01-12-94
TDS	EPA-160.1	97	-	-	-	RC3	01-13-94
pH (units)	EPA-150.1	100	-	-	-	DC	01-20-94
TRACE METALS mg/l:							
Aluminum	EPA-200.7	100	-	91	-	CP	01-26-94
Arsenic	EPA-206.3	100	-	100	-	CP	01-12-94
Cadmium	EPA-200.7	100	-	87	-	CP	01-26-94
Lead	EPA-239.2	100	-	90	-	CP	01-26-94
Manganese	EPA-200.7	108	-	99	-	CP	01-26-94
Molybdenum	EPA-200.7	100	-	82	-	CP	01-26-94
Nickel	EPA-200.7	102	-	91	-	CP	01-26-94
Selenium	EPA-270.3	100	-	100	-	CP	01-11-94
Vanadium	EPA-200.7	100	-	90	-	CP	01-26-94
Cobalt	EPA-200.7	90	-	88	-	CP	01-26-94
Beryllium	EPA-200.7	86	-	84	-	CP	01-26-94
ORGANICS:							
Chloroform	EPA-8260	103	-	104	-	CB	01-12-94
RADIOMETRIC:							
Uranium	EPA-908.1	102	-	101	-	DB	01-14-94
Ra226	EPA-903.0	118	-	112	-	DB	01-18-94
Th230	EPA-907.0	100	-	-	-	DB	01-13-94
Lead 210	NERHL-65-4	111	-	111	-	DB	01-24-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	20.73	25.30	-4.57	DB	08-13-93
Ra226	EPA-903.1	15.23	14.90	0.33	DB	09-17-93
Ra228	EPA-904.1	16.13	20.40	-4.27	DB	09-17-93
Gross Alpha	EPA-900.0	16.00	20.00	-4.00	DB	10-29-93
Gross Beta	EPA-900.0	19.00	15.00	4.00	DB	10-29-93

Report Approved By:



QUALITY ASSURANCE REPORT - UNC Mining & Milling

Report Date: 02-11-94

Project: Churchrock Operations

ELI #(s): 94:0297-0308

MAJOR IONS mg/l:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE SAMPLE ANALYZED
Calcium	EPA-200.7	100	--	93	--	CP	01-13-94
Magnesium	EPA-200.7	100	--	92	--	CP	01-13-94
Sodium	EPA-200.7	100	--	97	--	CP	01-13-94
Potassium	EPA-258.1	100	--	94	--	CP	01-13-94
Bicarbonate	EPA-310.1	100	--	100	--	DC	01-14-94
Sulfate	EPA-375.3	100	--	104	--	DC	01-21-94
Chloride	EPA-325.3	101	--	96	--	DC	01-14-94
Ammonia	EPA-350.1	100	--	102	--	DC	01-13-94
Nitrate	EPA-353.2	100	--	105	--	DC	01-12-94
TDS @ 180 C	EPA-160.1	100	--	--	--	RCB	01-13-94
pH (units)	EPA-150.1	100	--	--	--	DC	01-14-94
TRACE METALS mg/l:							
Aluminum	EPA-200.7	100	--	102	--	CP	01-26-94
Arsenic	EPA-206.3	100	--	105	--	PG	01-19-94
Cadmium	EPA-200.7	100	--	89	--	CP	01-26-94
Lead	EPA-239.2	100	--	96	--	CP	01-26-94
Manganese	EPA-200.7	94	--	103	--	CP	01-26-94
Molybdenum	EPA-200.7	100	--	93	--	CP	01-26-94
Nickel	EPA-200.7	100	--	90	--	CP	01-26-94
Selenium	EPA-270.3	100	--	104	--	CP	01-18-94
Vanadium	EPA-200.7	100	--	94	--	CP	01-26-94
Cobalt	EPA-200.7	100	--	89	--	CP	01-26-94
Beryllium	EPA-200.7	100	--	97	--	CP	01-26-94
ORGANICS:							
Chloroform	EPA-200.7	101	--	102	--	CB	01-13-94
RADIOMETRIC:							
Uranium	EPA-908.1	102	--	101	--	DB	01-16-94
Ra226	EPA-903.0	120	--	130	--	DB	01-22-94
Lead 210	NERHL-65-4	102	--	--	--	DB	01-27-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	20.73	25.30	-4.57	DB	08-13-93
Ra226	EPA-903.1	15.23	14.90	0.33	DB	09-17-93
Ra228	EPA-904.1	16.13	20.40	-4.27	DB	09-17-93
Gross Alpha	EPA-900.0	16.00	20.00	-4.00	DB	10-29-93
Gross Beta	EPA-900.0	19.00	15.00	4.00	DB	10-29-93

Report Approved By: *AS Ro*

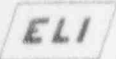


QUALITY ASSURANCE REPORT - UNC Mining & Milling
Report Date: 02-11-94
Project: Rechecks

MAJOR IONS mg/l:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE SAMPLE ANALYZED
Bicarbonate	EPA-310.1	100	-	89	-	DC	01-19-94
TDS	EPA-160.1	100	-	-	-	RCB	01-20-94
TRACE METALS mg/l:							
Molybdenum	EPA-200.7	89	-	99	-	CP	01-25-94

Report Approved By: 

dmc



QUALITY ASSURANCE REPORT - UNC Mining & Milling

Report Date: 02-11-94
 Project: Churchrock Operations
 ELI #(s): 94-0201-06

MAJOR IONS mg/l:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE SAMPLE ANALYZED
Calcium	EPA-200.7	100	-	93	-	CP	01-13-94
Magnesium	EPA-200.7	100	-	92	-	CP	01-13-94
Sodium	EPA-200.7	103	-	97	-	CP	01-13-94
Potassium	EPA-258.1	100	-	94	-	CP	01-13-94
Bicarbonate	EPA-310.1	100	-	96	-	DC	02-02-94
Sulfate	EPA-375.3	99	-	100	-	DC	02-03-94
Chloride	EPA-325.3	98	-	99	-	DC	02-03-94
Nitrate	EPA-353.2	107	-	106	-	DC	02-02-94
TDS @ 180 C	EPA-160.1	99	-	-	-	RCB	02-08-94
pH (units)	EPA-150.1	100	-	-	-	DC	02-02-94
TRACE METALS mg/l:							
Aluminum	EPA-200.7	101	-	91	-	CP	01-26-94
Arsenic	EPA-206.3	100	-	100	-	CP	01-12-94
Cadmium	EPA-200.7	100	-	87	-	CP	01-26-94
Lead	EPA-239.2	100	-	90	-	CP	01-26-94
Manganese	EPA-200.7	108	-	99	-	CP	01-26-94
Molybdenum	EPA-200.7	92	-	82	-	CP	01-26-94
Nickel	EPA-200.7	103	-	91	-	CP	01-26-94
Selenium	EPA-270.3	100	-	100	-	CP	01-11-94
Vanadium	EPA-200.7	100	-	90	-	CP	01-26-94
Cobalt	EPA-200.7	90	-	88	-	CP	01-26-94
Beryllium	EPA-200.7	100	-	84	-	CP	01-26-94
ORGANICS:							
Chloroform	EPA-200.7	103	-	104	-	CB	01-12-94
RADIOMETRIC:							
Uranium	EPA-908.1	102	-	101	-	DB	01-14-94
Ra226	EPA-903.0	117	-	113	-	DB	01-18-94
Ra228	EPA-904.0	71	-	-	-	DB	01-21-94
Th230	EPA-907.0	100	-	-	-	DB	01-13-94
Lead 210	NERHL-65-4	111	-	111	-	DB	01-24-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	20.73	25.30	-4.57	DB	08-13-93
Ra226	EPA-903.1	15.23	14.90	0.33	DB	09-17-93
Ra228	EPA-904.1	16.13	20.40	-4.27	DB	09-17-93
Gross Alpha	EPA-900.0	16.00	20.00	-4.00	DB	10-29-93
Gross Beta	EPA-900.0	19.00	15.00	4.00	DB	10-29-93

Report Approved By: *AS Ra*

ELI

QUALITY ASSURANCE REPORT - UNC Mining & Milling

Report Date: 02-11-94

Project: Churchrock Operations

ELI #(s): 94-0482-86

MAJOR IONS mg/l:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE SAMPLE ANALYZED
Calcium	EPA-200.7	103	-	91	-	CP	01-20-94
Magnesium	EPA-200.7	100	-	105	-	CP	01-20-94
Sodium	EPA-200.7	102	-	90	-	CP	01-20-94
Potassium	EPA-258.1	98	-	91	-	CP	01-20-94
Bicarbonate	EPA-310.1	100	-	91	-	DC	01-19-94
Sulfate	EPA-375.3	100	-	98	-	DC	01-21-94
Chloride	EPA-325.3	100	-	97	-	DC	01-20-94
Ammonium	EPA-350.1	102	-	94	-	DC	01-27-94
Nitrate	EPA-353.2	100	-	101	-	DC	02-02-94
pH (units)	EPA-150.1	100	-	-	-	DC	01-19-94
TRACE METALS mg/l:							
Aluminum	EPA-200.7	100	-	103	-	CP	01-28-94
Arsenic	EPA-206.3	100	-	105	-	PG	01-19-94
Cadmium	EPA-200.7	100	-	90	-	CP	01-28-94
Lead	EPA-239.2	90	-	80	-	CP	01-28-94
Manganese	EPA-200.7	100	-	94	-	CP	01-28-94
Molybdenum	EPA-200.7	100	-	95	-	CP	01-28-94
Nickel	EPA-200.7	100	-	97	-	CP	01-28-94
Selenium	EPA-270.3	100	-	104	-	CP	01-18-94
Vanadium	EPA-200.7	100	-	86	-	CP	01-28-94
Cobalt	EPA-200.7	100	-	98	-	CP	01-28-94
Beryllium	EPA-200.7	100	-	88	-	CP	01-28-94
ORGANICS:							
Chloroform	EPA-8260	100	-	98	-	BF	01-17-94
RADIOMETRIC:							
Uranium	EPA-908.1	92	-	95	-	DB	01-20-94
Ra226	EPA-903.0	97	-	89	-	DB	01-28-94
Ra228	EPA-904.0	100	-	-	-	DB	02-01-94
Th230	EPA-907.0	100	-	103	-	DB	01-22-94
Lead 210	NERHL-65-4	100	-	95	-	DB	01-28-94
Gross Alpha	EPA-900.0	100	-	-	-	DB	02-01-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	20.73	25.30	-4.57	DB	08-13-93
Ra226	EPA-903.1	15.23	14.90	0.33	DB	09-17-93
Ra228	EPA-904.1	16.13	20.40	-4.27	DB	09-17-93
Gross Alpha	EPA-900.0	16.00	20.00	-4.00	DB	10-29-93
Gross Beta	EPA-900.0	19.00	15.00	4.00	DB	10-29-93

Report Approved By: *AS Red*

ELI

QUALITY ASSURANCE REPORT - UNC Mining & Milling

Report Date: 02-16-94
 Project: Churchrock Operations
 ELI #(s): 94:0207-11

MAJOR IONS mg/l:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE SAMPLE ANALYZED
Calcium	EPA-200.7	100	-	93	-	CP	01-13-94
Magnesium	EPA-200.7	100	-	92	-	CP	01-13-94
Sodium	EPA-200.7	103	-	97	-	CP	01-13-94
Potassium	EPA-258.1	100	-	94	-	CP	01-13-94
Bicarbonate	EPA-310.1	100	-	96	-	DC	02-02-94
Sulfate	EPA-375.3	99	-	100	-	DC	02-03-94
Chloride	EPA-325.3	98	-	99	-	DC	02-03-94
Ammonium	EPA-350.1	100	-	105	-	DC	02-09-94
Nitrate	EPA-353.2	100	-	99	-	DC	02-02-94
pH (units)	EPA-150.1	100	-	-	-	DC	02-02-94
TRACE METALS mg/l:							
Aluminum	EPA-200.7	100	-	100	-	CP	01-26-94
Arsenic	EPA-206.3	100	-	100	-	CP	01-12-94
Cadmium	EPA-200.7	100	-	102	-	CP	01-26-94
Lead	EPA-239.2	90	-	93	-	CP	01-26-94
Manganese	EPA-200.7	88	-	109	-	CP	01-26-94
Molybdenum	EPA-200.7	100	-	108	-	CP	01-26-94
Nickel	EPA-200.7	100	-	102	-	CP	01-26-94
Selenium	EPA-270.3	100	-	100	-	CP	01-11-94
Vanadium	EPA-200.7	100	-	99	-	CP	01-26-94
Cobalt	EPA-200.7	100	-	100	-	CP	01-26-94
Beryllium	EPA-200.7	100	-	100	-	CP	01-26-94
ORGANICS:							
Chloroform	EPA-8260	103	-	104	-	CB	01-13-94
RADIOMETRIC:							
Uranium	EPA-908.1	102	-	101	-	DB	01-14-94
Ra226	EPA-903.0	118	-	112	-	DB	01-18-94
Th230	EPA-907.0	100	-	-	-	DB	01-13-94
Lead 210	NERHL-65-4	111	-	111	-	DB	01-24-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	20.73	25.30	-4.57	DB	08-13-93
Ra226	EPA-903.1	15.23	14.90	0.33	DB	09-17-93
Ra228	EPA-904.1	16.13	20.40	-4.27	DB	09-17-93
Gross Alpha	EPA-900.0	16.00	20.00	-4.00	DB	10-29-93
Gross Beta	EPA-900.0	19.00	15.00	4.00	DB	10-29-93

Report Approved By: *AB Res*

ELI

QUALITY ASSURANCE REPORT - UNC Mining & Milling
 Report Date: 02-16-94
 Project: Churchrock Operations
 ELI #(s): 94:0493-96

MAJOR IONS mg/l:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE SAMPLE ANALYZED
Calcium	EPA-200.7	100	-	91	-	PG	01-20-94
Magnesium	EPA-200.7	100	-	105	-	PG	01-20-94
Sodium	EPA-200.7	100	-	90	-	PG	01-20-94
Potassium	EPA-258.1	100	-	91	-	PG	01-20-94
Bicarbonate	EPA-310.1	100	-	91	-	DC	01-19-94
Sulfate	EPA-375.3	100	-	96	-	DC	01-24-94
Chloride	EPA-325.3	100	-	97	-	DC	01-20-94
Ammonium	EPA-350.1	100	-	94	-	DC	01-27-94
Nitrate	EPA-353.2	100	-	101	-	DC	02-02-94
TDS @ 180 C	EPA-160.1	100	-	-	-	DC	01-20-94
pH (units)	EPA-150.1	100	-	-	-	DC	01-19-94
TRACE METALS mg/l:							
Alumina	EPA-200.7	92	-	98	-	CP	01-28-94
Arsenic	EPA-206.3	100	-	100	-	PG	01-19-94
Cadmium	EPA-200.7	100	-	103	-	CP	01-28-94
Lead	EPA-239.2	93	-	80	-	CP	01-28-94
Manganese	EPA-200.7	100	-	92	-	CP	01-28-94
Molybdenum	EPA-200.7	100	-	90	-	CP	01-28-94
Nickel	EPA-200.7	100	-	99	-	CP	01-28-94
Selenium	EPA-270.3	100	-	104	-	CP	01-18-94
Vanadium	EPA-200.7	100	-	88	-	CP	01-28-94
Cobalt	EPA-200.7	100	-	89	-	CP	01-28-94
Beryllium	EPA-200.7	100	-	100	-	CP	01-28-94
ORGANICS:							
Chloroform	EPA-8260	100	-	99	-	BF	01-17-94
RADIOMETRIC:							
Uranium	EPA-908.1	92	-	95	-	DB	01-20-94
Ra226	EPA-903.0	97	-	89	-	DB	01-28-94
Ra228	EPA-904.0	100	-	-	-	DB	02-02-94
Th230	EPA-907.0	100	-	103	-	DB	01-22-94
Lead 210	NERHL-65-4	100	-	95	-	DB	01-28-94
Gross Alpha	EPA-900.0	100	-	-	-	DB	01-28-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	20.73	25.30	-4.57	DB	08-13-93
Ra226	EPA-903.1	15.23	14.90	0.33	DB	09-17-93
Ra228	EPA-904.1	16.13	20.40	-4.27	DB	09-17-93
Gross Alpha	EPA-900.0	16.00	20.00	-4.00	DB	10-29-93
Gross Beta	EPA-900.0	19.00	15.00	4.00	DB	10-29-93

Report Approved By: *DB Rea*

QUALITY ASSURANCE REPORT - UNC Mining & Milling

Report Date: 02-16-94

Project: Churchrock Operations

ELI #(s): 94-0487-92

MAJOR IONS mg/l:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE SAMPLE ANALYZED
Calcium	EPA-200.7	100	-	91	-	PG	01-20-94
Magnesium	EPA-200.7	100	-	105	-	PG	01-20-94
Sodium	EPA-200.7	100	-	90	-	PG	01-20-94
Potassium	EPA-258.1	100	-	91	-	PG	01-20-94
Bicarbonate	EPA-310.1	100	-	91	-	DC	01-19-94
Sulfate	EPA-375.3	100	-	88	-	DC	01-21-94
Chloride	EPA-325.3	100	-	97	-	DC	01-20-94
Ammonium	EPA-350.1	100	-	94	-	DC	01-27-94
Nitrate	EPA-353.2	100	-	101	-	DC	02-02-94
TDS @ 180 C	EPA-160.1	100	-	-	-	DC	01-20-94
pH (units)	EPA-150.1	100	-	-	-	DC	01-19-94
TRACE METALS mg/l:							
Aluminum	EPA-200.7	92	-	98	-	CP	01-28-94
Arsenic	EPA-206.3	100	-	100	-	PG	01-19-94
Cadmium	EPA-200.7	100	-	103	-	CP	01-28-94
Lead	EPA-239.2	93	-	80	-	CP	01-28-94
Manganese	EPA-200.7	100	-	92	-	CP	01-28-94
Molybdenum	EPA-200.7	100	-	90	-	CP	01-28-94
Nickel	EPA-200.7	100	-	99	-	CP	01-28-94
Selenium	EPA-270.3	100	-	104	-	CP	01-18-94
Vanadium	EPA-200.7	100	-	88	-	CP	01-28-94
Cobalt	EPA-200.7	100	-	89	-	CP	01-28-94
Beryllium	EPA-200.7	100	-	100	-	CP	01-28-94
ORGANICS:							
Chloroform	EPA-8260	100	-	99	-	BF	01-17-94
RADIOMETRIC:							
Uranium	EPA-908.1	92	-	95	-	DB	01-20-94
Ra226	EPA-903.0	97	-	89	-	DB	01-28-94
Ra228	EPA-904.0	110	-	-	-	DB	02-02-94
Th230	EPA-907.0	100	-	103	-	DB	01-22-94
Lead 210	NERHL-65-4	100	-	95	-	DB	01-28-94
Gross Alpha	EPA-900.0	100	-	-	-	DB	02-02-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	20.73	25.30	-4.57	DB	08-13-93
Ra226	EPA-903.1	15.23	14.90	0.33	DB	09-17-93
Ra228	EPA-904.1	16.13	20.40	-4.27	DB	09-17-93
Gross Alpha	EPA-900.0	16.00	20.00	-4.00	DB	10-29-93
Gross Beta	EPA-900.0	19.00	15.00	4.00	DB	10-29-93

Report Approved By: *DB Pa*



QUALITY ASSURANCE REPORT - UNC Mining & Milling

Report Date: 02-25-94

ELI #(s): 94:1028-29

RADIOMETRIC:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE SAMPLE ANALYZED
Uranium	EPA-908.1	93	-	104	-	DB	07-09-94
Ra226	EPA-903.0	98	-	97	-	DB	02-14-94
Th230	EPA-907.0	100	-	-	-	DB	02-09-94
Lead 210	NERHL-65-4	120	-	-	-	DB	02-22-94
Polonium 210	RM03008						
	USAEC 1970.	100	-	-	-	DB	02-10-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	20.73	25.30	-4.57	DB	08-13-93
Ra226	EPA-903.1	15.23	14.90	0.33	DB	09-17-93
Ra228	EPA-904.1	16.13	20.40	-4.27	DB	09-17-93
Gross Alpha	EPA-900.0	16.00	20.00	-4.00	DB	10-29-93
Gross Beta	EPA-900.0	19.00	15.00	4.00	DB	10-29-93

Report Approved By: *DB Ra*

dmc 94:1028-29



QUALITY ASSURANCE REPORT - UNC Mining & Milling

Report Date: 06-03-94

Project: Churchrock Operations- Quarterlies

ELI #(s): 94:9798-8012

MAJOR IONS:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE ANALYZED
Calcium	EPA-200.7	100	102	97	97	PG	04-19-94
Magnesium	EPA-200.7	100	100	95	93	PG	04-19-94
Sodium	EPA-200.7	99	104	96	96	PG	04-19-94
Potassium	EPA-258.1	100	98	96	96	PG	04-19-94
Bicarbonate	EPA-310.1	100	100	99	99	RK	04-20-94
Sulfate	EPA-375.3	102	102	97	97	RK	04-21-94
Chloride	EPA-325.3	101	100	97	97	RK	04-20-94
Ammonium	EPA-350.1	100	100	100	96	SD	04-25-94
Nitrate	EPA-353.2	100	100	102	102	SD	04-19-94
TDS @ 180 C	EPA-160.1	100	100	-	-	RB	04-20-94
pH (units)	EPA-150.1	100	100	-	-	RK	04-20-94
TRACE METALS:							
Aluminum	EPA-200.7	100	100	96	96	CP	04-25-94
Arsenic	EPA-206.3	100	100	83	83	PG	04-22-94
Cadmium	EPA-200.7	100	100	100	101	CP	04-25-94
Lead	EPA-239.2	100	100	98	91	CP	04-25-94
Manganese	EPA-200.7	100	100	99	110	CP	04-25-94
Molybdenum	EPA-200.7	100	100	110	106	CP	04-25-94
Nickel	EPA-200.7	100	100	106	107	CP	04-25-94
Selenium	EPA-270.3	102	100	93	93	PG	04-21-94
Vanadium	EPA-200.7	100	102	110	102	CP	04-25-94
Beryllium	EPA-200.7	100	100	111	96	CP	04-25-94
Cobalt	EPA-200.7	100	100	95	98	CP	04-25-94
RADIOMETRIC:							
Uranium	EPA-908.1	97	97	101	101	DB	04-21-94
Ra226	EPA-903.0	84	84	101	101	DB	05-04-94
Ra228	EPA-904.0	100	100	78	78	DB	05-09-94
Th230	EPA-907.0	100	100	-	-	DB	04-27-94
Lead 210	NERHL-65-4	-	-	95	95	DB	04-29-94
Polonium 210	RM03008 USAEC 1970.	100	100	-	-	DB	05-20-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	15.13	17.55	-2.42	DB	10-19-93
Ra226	EPA-903.1	13.67	13.57	0.10	DB	10-19-93
Ra228	EPA-904.1	15.26	14.55	0.71	DB	10-19-93
Gross Alpha	EPA-900.0	23.65	34.25	-10.60	DB	01-28-94
Gross Beta	EPA-900.0	50.60	65.64	-15.04	DB	01-28-94

Report Approved By:



QUALITY ASSURANCE REPORT - UNC Mining & Milling

Report Date: 06-03-94

Project: Churchrock Operations- Quarterlylies

ELI #(s): 94:9741-53

MAJOR IONS:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE ANALYZED
Calcium	EPA-200.7	100	100	97	97	PG	04-19-94
Magnesium	EPA-200.7	100	100	95	95	PG	04-19-94
Sodium	EPA-200.7	99	99	96	96	PG	04-19-94
Potassium	EPA-258.1	100	100	96	96	PG	04-19-94
Bicarbonate	EPA-310.1	99	99	84	-	RK	04-19-94
Sulfate	EPA-375.3	99	102	103	101	RK	04-18-94
Chloride	EPA-325.3	102	99	105	99	RK	04-19-94
Ammonium	EPA-350.1	100	96	100	100	SD	04-25-94
Nitrate	EPA-353.2	97	97	100	-	RK	04-15-94
TDS @ 180 C	EPA-160.1	100	100	-	-	RB	04-20-94
pH (units)	EPA-150.1	99	100	-	-	RK	04-19-94
TRACE METALS:							
Aluminum	EPA-200.7	100	100	88	103	CP	04-25-94
Arsenic	EPA-206.3	100	100	83	83	PG	04-22-94
Cadmium	EPA-200.7	100	100	90	103	CP	04-25-94
Lead	EPA-239.2	100	100	103	103	CP	04-25-94
Manganese	EPA-200.7	100	100	94	99	CP	04-25-94
Molybdenum	EPA-200.7	100	100	106	106	CP	04-25-94
Nickel	EPA-200.7	100	100	103	103	CP	04-25-94
Selenium	EPA-270.3	102	102	93	93	PG	04-21-94
Vanadium	EPA-200.7	100	100	95	95	CP	04-25-94
Beryllium	EPA-200.7	100	100	93	95	CP	04-25-94
Cobalt	EPA-200.7	100	100	93	96	CP	04-25-94
RADIOMETRIC:							
Uranium	EPA-908.1	97	97	101	101	DB	04-21-94
Ra226	EPA-903.0	100	92	93	102	DB	04-25-94
Ra228	EPA-904.0	100	-	-	-	DB	05-04-94
Th230	EPA-907.0	100	100	-	140	DB	04-20-94
Lead 210	NERHL-65-4	-	-	92	92	DB	05-02-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	15.13	17.55	-2.42	DB	10-19-93
Ra226	EPA-903.1	13.67	13.57	0.10	DB	10-19-93
Ra228	EPA-904.1	15.26	14.55	0.71	DB	10-19-93
Gross Alpha	EPA-900.0	23.65	34.25	-10.60	DB	01-28-94
Gross Beta	EPA-900.0	50.60	65.64	-15.04	DB	01-28-94

Report Approved By: *DB*



QUALITY ASSURANCE REPORT - UNC Mining & Milling

Report Date: 06-06-94

Project: Churchrock Operations Quarterly

ELI #(s): 94:14753-60

MAJOR IONS:	METHOD	Dup #1 %	Dup #2 %	Spk #1 %	Spk #2 %	ANALYST	DATE ANALYZED
Calcium	EPA-200.7	100	100	97	97	PG	04-25-94
Magnesium	EPA-200.7	100	100	97	97	PG	04-25-94
Sodium	EPA-200.7	100	100	99	99	PG	04-25-94
Potassium	EPA-258.1	102	102	95	95	PG	04-25-94
Bicarbonate	EPA-310.1	100	100	99	99	RK	04-25-94
Sulfate	EPA-375.3	97	97	102	102	RK	04-27-94
Chloride	EPA-325.3	100	100	98	98	RK	04-29-94
Ammonium	EPA-350.1	100	100	97	100	RK	04-28-94
Nitrate	EPA-353.2	103	103	102	102	RK	04-26-94
TDS @ 180 C	EPA-160.1	100	100	-	-	RB	04-29-94
pH (units)	EPA-150.1	100	100	-	-	RK	04-25-94

TRACE METALS:

Aluminum	EPA-200.7	100	100	90	90	CP	04-25-94
Arsenic	EPA-206.3	100	100	89	105	PG	04-28-94
Cadmium	EPA-200.7	100	100	95	95	CP	04-25-94
Lead	EPA-239.2	100	100	94	94	CP	04-25-94
Manganese	EPA-200.7	100	100	104	104	CP	04-25-94
Molybdenum	EPA-200.7	100	100	111	111	CP	04-25-94
Nickel	EPA-200.7	100	100	103	103	CP	04-25-94
Selenium	EPA-270.3	99	99	91	91	PG	04-27-94
Vanadium	EPA-200.7	100	100	105	105	CP	04-25-94
Beryllium	EPA-200.7	100	100	104	104	CP	04-25-94
Cobalt	EPA-200.7	100	100	104	104	CP	04-25-94

RADIOMETRIC:

Uranium	EPA-908.1	101	101	98	98	DB	04-28-94
Ra226	EPA-903.0	109	109	89	89	DB	05-04-94
Ra228	EPA-904.1	100	100	-	-	DB	05-04-94
Th230	EPA-907.0	100	100	-	-	DB	04-27-94
Lead 210	NERHL-65-4	100	100	91	91	DB	05-06-94
Gross Alpha	EPA-900.0	100	100	-	-	DB	05-15-94

USEPA-ESML-LV INTERCOMPARISON STUDY RESULTS

Radiometric	Method	ELI Value	Standard	Difference	Analyst	Date
Uranium	EPA-908.1	15.13	17.55	-2.42	DB	10-19-93
Ra226	EPA-903.1	13.67	13.57	0.10	DB	10-19-93
Ra228	EPA-904.1	15.26	14.55	0.71	DB	10-19-93
Gross Alpha	EPA-900.0	23.65	34.25	-10.60	DB	01-28-94
Gross Beta	EPA-900.0	50.60	65.64	-15.04	DB	01-28-94

Report Approved By: 