SEMI-ANNUAL
QUALITY ASSURANCE REPORT
GROUND WATER MONITORING

SECOND HALF OF 1999
(JULY - OCTOBER)

UNITED NUCLEAR CORPORATION

P.O. Box 3077
Gallup, New Mexico 87305-3077

Telephone: (505) 722-6651
Fax: (505) 722-6654

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

February 25, 2000

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

40-8907

Re: Semi-Annual Quality Assurance Report
Ground Water Monitoring - Second Half of 1999

Dear Mr. Lyssy,

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 second half of 1999.

Two sampling episodes occurred in the second half of 1999 -- in July and in October.

Sincerely,

Larry Bush
Manager

LB:r

Enclosure

cc: NRC, Rockville, MD
NRC, Arlington, TX
Steve Cline, GE
Roy Blickwedel, GE

NMSS01 Public

SEMI-ANNUAL QUALITY ASSURANCE
CHURCH ROCK SITE
JULY AND OCTOBER SAMPLING EVENTS
JANUARY 2000

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1.0 REQUIREMENTS

The quality assurance and control procedures are contained in Section 3.0 of the Remedial Action Plan of 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 PROCEDURE

Copies of the field sampling report sheets for the third and forth quarters of 1999, are included as Appendix A. The 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 contact laboratory is located in Casper, Wyoming. Energy Labs inspect 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 EVALUATION

Analytical reports are reviewed by the Church Rock Manager and the 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 theses 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

GROUND WATER MONITORING FIELD DATA SHEET

WATER DEPTH AND PURGING

3rd QUARTER 1999

WELL NO.	MONTH/ DAY	TIME	WATER DEPTH	PURGING METHOD	EST. VOL. PURGED
502-B	7-12	1506	162.4	BAILED	3 gal.
504-B	7-12	1442	160.9	BAILED	3 "
509-D	7-12	1140	64.6	AIR LIFT	20 "
515-A	7-12	1025	98.8	AIR LIFT	5 "
516-A	7-12	1101	101.4	AIR LIFT	2 "
517	7-12	0959	100.3	AIR LIFT	2 "
518	7-12	1518	132.4	BAILED	3 "
604	7-12	1036	98.6	AIR LIFT	10 "
614	7-12	1007	96.4	AIR LIFT	2 "
619	7-12	1048	127.3	AIR LIFT	25 "
624	7-12	1325	47.8	AIR LIFT	15 "
627	7-12	1414	53.0	AIR LIFT	5 "
632	7-12	1345	46.4	AIR LIFT	1 "
TWQ-141	7-12	0850	194.9	AIR LIFT	30 "
TWQ-142	7-12	0925	204.1	AIR LIFT	30 "
TWQ-143	7-12	0937	210.8	AIR LIFT	30 "
804	7-21	1410	49.46		
805	7-21	1359	51.00		
806	7-21	1353	50.8		
807	7-21	1345	53.6		

GROUND WATER MONITORING FIELD DATA SHEET
3rd QUARTER 19 99
WATER DEPTH AND PURGING

Well No.	Month/Day	Time	Water Depth	Purging Method	Est. Vol. Purged
GW-1	7-12	1306	59.4	AIR LIFT	15 gal
GW-2	7-12	1336	54.9	AIR LIFT	15 "
GW-3	7-12	1400	51.7	AIR LIFT	5 "
GW-4	7-12	1130	48.9	AIR LIFT	5 "
EPA-1		NO	WATER	NO WATER	
EPA-2	7-19	1254	170.3	Pump	40 "
EPA-4	7-19	1031	200.3	pump	70 "
EPA-5	7-19	1146	119.5	pump	42 "
EPA-6		DELETED		DELETED	
EPA-7	7-19	1132	108.6	pump	48 "
EPA-8	7-19	0924	213.4	pump	83 "
EPA-9	7-19	1025	169.1	pump	8 "
EPA-13	7-19	1115	164.9	pump	17 "
EPA-14	7-19	1427	108.2	pump	182 "
EPA-15	DELETED		DELETED		
EPA-22A	NO WATER			NO WATER	
EPA-23	7-19	1350	46.4	pump	280 "
EPA-25	7-19	1500	50.7	pump	30 "
EPA-27	NO WATER			NO WATER	
EPA-28	7-19	1330	61.5	pump	15 "
*411					
420	7-12	0948	134.8	AIR LIFT	1 "

* LARGE AMOUNT OF OIL IN WELL. BAILED WILL NOT GO THROUGH OIL TO GET ANY WATER SAMPLE

GROUND WATER MONITORING FIELD DATA SHEET

SAMPLING

3rd QUARTER 19 99

WELL NO.	MONTH/ DAY	TIME	SAMPLING METHOD	pH	COND.	C° TEMP.	COMMENTS
502-B	7-13	1506	BAILED	4.7	4,860	16.5	
504-B	7-13	1450	BAILED	6.5	4,640	16.9	
509-D	7-13	1144	BAILED	6.5	6,880	15.4	
515-A	7-13	1015	BAILED	5.7	7,130	15.9	
516-A	7-13	1103	BAILED	6.5	1,058	16.2	
517	7-13	0955	BAILED	4.6	4,580	14.9	
518	7-13	1520	BAILED	3.5	5,960	15.4	
604	7-13	1037	BAILED	4.6	6,540	17.2	
614	7-13	1014	BAILED	7.0	7,700	15.8	
619	7-13	1049	BAILED	6.6	4,820	15.3	
624	7-13	1325	BAILED	6.7	5,240	15.9	
627	7-13	1431	BAILED	7.0	5,390	16.6	
632	7-13	1345	BAILED	6.3	6,120	16.4	
TWQ-141	7-13	0854	BAILED	6.8	1,352	14.8	
TWQ-142	7-13	0925	BAILED	6.8	1,620	15.8	
TWQ-143	7-13	0937	BAILED	6.8	1,520	15.3	
801	7-20	0900	Pump	6.5	7,570	14.4	
802	7-20	0850	Pump	6.5	7,270	14.5	
803	Pump FROZE-UP IN WELL CASTING						
FIELD BLANK	7-13	1400		7.7	2,840	24.8	
RINSATE	7-13	1355		7.4	8,570	24.3	

GROUND WATER MONITORING FIELD DATA SHEET

3rd QUARTER 1999

SAMPLING

Well No.	Month/ Day	Time	Sampling Method	pH	Cond.	C° Temp.	Comments
GW-1	7-13	1300	BAILED	6.7	4240	16.0	
GW-2	7-13	1336	BAILED	6.6	5320	15.2	
GW-3	7-13	1413	BAILED	6.7	4,770	16.2	
GW-4	7-13	1130	BAILED	7.2	3920	16.8	
EPA-1	7-20	1100	Pump	NO	WATER		
EPA-2	7-20	1300	Pump	6.7	3,220	15.5	
EPA-4	7-20	1040	Pump	6.5	4,460	14.6	
EPA-5	7-20	1147	Pump	6.5	7350	15.8	
EPA-6		DELETED		DELETED			
EPA-7	7-20	1133	Pump	6.06	7,350	14.8	
EPA-8	7-20	0925	Pump	6.36	4,250	15.2	
EPA-9	7-20	1030	Pump	3.8	5,210	16.9	
EPA-13	7-20	1115	Pump	6.2	5,760	14.8	
EPA-14	7-20	1430	Pump	6.2	3800	14.9	
EPA-15		DELETED		DELETED			
EPA-22A		NO	WATER	NO	WATER		
EPA-23	7-20	1352	Pump	6.7	4,960	14.8	
EPA-25	7-20	1500	Pump	6.8	4230	15.7	
EPA-27		NO	WATER	NO	WATER		
EPA-28	7-20	1332	Pump	6.9	5,080	16.0	
411		DELETED		DELETED			
420	7-13	1000	BAILED	6.4	3610	16.7	

EPA WELLS

3rd Quarter 1999

Date	Well No.	HP	Elevation T.O.P.	Meter Reading Start	(-)	Meter Reading End	=	Gals. Purged	Time for Well To Go Dry Minutes/Seconds
7-19	EPA-1	1/2	7035.544	NO		WATER			
** 7-19	EPA-2	1/3	7019.485	1,349,840		METER SANDED-UP		EST 40	17.14
7-19	EPA-4	1/2	7069.798	1,349,663		1,349,733		70	15:57
7-19	EPA-5	1/3	7011.444	1349798		1349840		42	6.58
7-19	EPA-7	1/3	7011.662	1,349,750		1,349,798		48	4:32
7-19	EPA-8	1/2	7076.402	1,349,572		1,349,655		83	24:50
7-19	EPA-9	1/3	7076.612	1,349,655		1,349,663		8	1:25
7-19	EPA-13	1/2	7030.467	1,349,733		1,349,750		17	1:19
7-19	EPA-14	1/2	6965.611	1,350,144		1,350,326		182	16:30
7-19	EPA-22A	1/2	6954.512	NO		WATER			
7-19	EPA-23	2	6926.312	1,349,864		1,350,144		280	22:30
** 7-19	EPA-25	1/2	6903.383	1,350,326		METER SANDED-UP		EST 30	21:40
7-19	EPA-27	1/3	6910.946	NO		WATER			
7-19	EPA-28	1	6917.861	1,349,848		1,349,864		15	1:06
	NR-1	1/3		1,350,330		1350437		107	15:30

*Deleted EPA-3, EPA-12, EPA-17, EPA-18 due to lack of water.
Also EPA-15

** EXCESSIVE AMOUNT OF SAND IN WATER.

Rev. 6-97

GROUND WATER MONITORING FIELD DATA SHEET

WATER DEPTH AND PURGING

4th QUARTER 1999

WELL NO.	MONTH/ DAY	TIME	WATER DEPTH	PURGING METHOD	EST. VOL. PURGED
502-B	10-4	1325	162.0'	BAILED	3 gal.
504-B	10-4	1300	160.3'	BAILED	3 gal.
509-D	10-4	1025	64.8'	AIR LIFT	20 gal.
515-A	10-4	0925	98.7'	AIR LIFT	4 gal.
516-A	10-4	0955	102.4'	AIR LIFT	2 gal.
517	10-4	0857	102.5'	AIR LIFT	2 gal.
518	10-4	1340	132.4'	BAILED	3 gal.
604	10-4	0935	97.8'	AIR LIFT	10 gal.
614	10-4	0910	96.6'	AIR LIFT	1 gal.
619	10-4	0945	127.4'	AIR LIFT	25 gal.
624	10-4	1050	46.8'	AIR LIFT	15 gal.
* 627	10-4	1140	53.0'	AIR LIFT	0
632	10-4	1110	45.4'	AIR LIFT	1 gal.
** TWQ-141	10-4	0800	45.2'	AIR LIFT	45 gal.
TWQ-142	10-4	0820	203.5'	AIR LIFT	30 gal.
TWQ-143	10-4	0830	210.6'	AIR LIFT	30 gal.
804	10-13	1035	49.43		
805	10-13	1040	51.1		
806	10-13	1043	50.8		
807	10-13	1050	53.5		

** WELL STAN pipe BROKEN by CATTLES. FLOOD WATER FILL WELL WITH SAND + WATER

* SOMETHING IN CASTING, COULDN'T GET 6" debuzzer down pipe to WATER

GROUND WATER MONITORING FIELD DATA SHEET

WATER DEPTH AND PURGING

4th QUARTER 1999

WELL NO.	MONTH/ DAY	TIME	WATER DEPTH	PURGING METHOD	EST. VOL. PURGED
GW-1	10-4	1037	58.9'	AIRLIFT	15 GAL.
GW-2	10-4	1100	53.6'	AIRLIFT	15 GAL.
GW-3	10-4	1125	50.7'	AIRLIFT	5 GAL.
GW-4	10-4	1015	49.3'	AIRLIFT	4 GAL.
* EPA-1		NO	WATER		
EPA-2	10-11	1115	170.2'	Pump	40 GAL.
EPA-4	10-11	0932	200.6'	pump	92 GAL.
EPA-5	10-11	1030	119.6'	Pump	40 GAL.
EPA-7	10-11	1012	108.5'	Pump	46 GAL.
EPA-8	10-11	0815	213.5'	Pump	66 GAL.
EPA-9	10-11	0915	169.2'	Pump	7 GAL.
EPA-13	10-11	0750	165.0'	Pump	15 GAL
EPA-14	10-11	1422	108.2'	Pump	177 GAL.
* EPA-22A					
EPA-23	10-11	1342	46.2'	Pump	245 GAL.
EPA-25	10-11	1500	51.0'	pump	30 GAL.
* EPA-27					
EPA-28	10-11	1330	60.6'	Pump	15 GAL.
** 411					
420	10-4	0845	135.3	AIRLIFT	2 GAL

* DELETED EPA-1, [redacted], EPA-22-A, EPA-27 DUE TO LACK OF WATER

** LARGE AMOUNT OF OIL IN WELL. BAILER WILL NOT go Through oil TO GET A WATER SAMPLE

GROUND WATER MONITORING FIELD DATA SHEET

4th QUARTER 1999

SAMPLING

Well No.	Month/ Day	Time	Sampling Method	pH	Cond.	C° Temp.	Comments
502-B	10-5	1350	BAILED	4.25	4,980	14.7	
504-B	10-5	1335	BAILED	5.73	4,770	15.7	
509-D	10-5	1057	BAILED	6.56	6,670	14.0	
515-A	10-5	0949	BAILED	5.36	7,320	14.5	
516-A	10-5	1030	BAILED	6.40	1,082	14.4	
517	10-5	0916	BAILED	4.50	4,600	14.2	
518	10-5	1400	BAILED	3.48	6,020	16.6	
604	10-5	1,001	BAILED	4.42	6970	14.7	
614	10-5	0944	BAILED	6.80	7,770	14.9	
619	10-5	1013	BAILED	6.86	4,560	14.3	
624	10-5	1127	BAILED	6.78	5,300	14.2	
627	10-5	1236	BAILED	7.09	5,500	15.3	
632	10-5	1147	BAILED	6.60	6,270	14.4	
★TWQ-141	10-5	0825	BAILED	—	—	—	
TWQ-142	10-5	0833	BAILED	7.60	1,660	14.7	
TWQ-143	10-5	0845	BAILED	7.52	1,466	14.8	
801	10-5	1415	BAILED	6.37	7,070	15.1	
802	10-11	0730	Pump	6.62	6,880	13.9	
803	10-11	0740	Pump	6.58	6,770	14.4	
Field Blank	10-5	1230		7.69	3,540	21.5	
Rinsate	10-5	1227		7.44	3,780	21.5	

★WELL filled with sand, NO WATER for sample

GROUND WATER MONITORING FIELD DATA SHEET

4th QUARTER 19 99

SAMPLING

Well No.	Month/ Day	Time	Sampling Method	pH	Cond.	C° Temp.	Comments
GW-1	10-5	1117	Bailed	6.75	4,380	14.6	
GW-2	10-5	1138	Bailed	6.52	5,270	13.5	
GW-3	10-5	1205	Bailed	6.68	4,840	15.1	
* GW-4	10-5	1047	Bailed				
** EPA-1							
EPA-2	10-12	1316	pump	6.64	3,600	15.8	
EPA-4	10-12	1005	pump	6.60	4360	14.6	
EPA-5	10-12	1036	Pump	6.45	7,290	15.4	
** EPA-6							
EPA-7	10-12	1025	Pump	6.01	7,010	14.7	
EPA-8	10-12	0938	Pump	6.45	4,380	13.5	
EPA-9	10-12	0950	Pump	4.9	5,070	13.1	
EPA-13	10-12	0920	Pump	6.1	5,650	13.6	
EPA-14	10-12	1455	Pump	6.54	3,710	16.4	
* EPA-15							
** EPA-22A	10-1[illegible]						
EPA-23	10-12	1353	Pump	6.62	4,700	16.2	
EPA-25	10-12	1516	Pump	6.83	4,210	16.1	
** EPA-27							
EPA-28	10-12	1338	Pump	6.90	5,060	14.5	
** 411							
420	10-5	0900	Bailed	6.72	3,850	14.2	

* WELL GW4 DIDNT RECOVER, NOT ENOUGH WATER FOR A SMAPLE.

** DELETED WELLS EPA-1, EPA-6, EPA-15, EPA-27 DUE TO LACK OF WATER, ALSO #411

EPA WELLS

4th Quarter 1999

Date	Well No.	HP	Elevation T.O.P.	Meter Reading Start	(-)	Meter Reading End	=	Gals. Purged	Time for Well To Go Dry Minutes/Seconds
	EPA-1	1/2	7035.544	DELETED		due TO LACK OF		WATER	
** 10-11	EPA-2	1/3	7019.485	804,440		—		EST. 40	18:23
10-11	EPA-4	1/2	7069.798	804,262		804,354		92	22:30
10-11	EPA-5	1/3	7011.444	804,400		804,440		40	6:50
10-11	EPA-7	1/3	7011.662	804,354		804,400		46	4:25
10-11	EPA-8	1/2	7076.402	804,189		804,255		66	25:21
10-11	EPA-9	1/3	7076.612	804,255		804,262		7	1:29
10-11	EPA-13	1/2	7030.467	804,174		804,189		15	1:14
10-11	EPA-14	1/2	6965.611	804,710		804,887		177	18:27
*	EPA-15	5-30	7002.932						
* 10-11	EPA-22A	1/2	6954.512						
10-11	EPA-23	2	6926.312	804,465		804,710		245	21:27
** 10-11	EPA-25	1/2	6903.383	804,887		—		EST. 30	21:10
* 10-11	EPA-27	1/3	6910.946						
	EPA-28	1	6917.861	804,450		804,465		15	1:10
***	NR-1	1/3							

*Deleted EPA-3, EPA-12, EPA-17, EPA-18 due to lack of water.

** METER WOULDN'T RECORD, due TO LARGE AMOUNT OF SAND IN WATER.

*** NR-1 IS ONLY SAMPLE ON FRIST + THIRD QUARTERS

Rev. 4-96

APPENDIX B

CHAIN OF CUSTODY FORMS

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

Alluvium

CHAIN OF CUSTODY

Energy Laboratories, Inc.
Laboratory

2393 N. Salt Creek Highway
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- 5- 7- 99 (PG. 1 OF 2)

Sample Description	Date	Time	Filter 0.45u	PRESERVATION plain	HNO_3	H_2SO_4	$Na_2S_2O_3$	NaOH	Preserved By	Analysis Required (For all samples listed)
TWQ - 141	7-13-99	0854	ne ✓	LKB	ne ✓	ne ✓	LKB			As, Be, Ca, Cd, Cl, HCO_3,
TWQ - 142		0925								K, Mg, Mn, Na, NH_3, Ni,
TWQ - 143		0937								NO_3, Pb, Pb-210, pH, Se,
517		0960								SO_4, TDS, Th-230, U, V,
~~801~~		~~1000~~	NOT	HERE	Production	Well	Not	Sampled		Chloroform, Gross
420		1000								Alpha (-) U & Rn,
614		1014								Combined Ra-226 & Ra-228, Al,
515-A		1015						N A		Co, Mo
604		1037								
619		1049	1 Broken	VOA						Wells GW-3 and GW-4 require Po-210
516-A		1103	1 Broken	VOA						analysis in addition to above.
509-D		1144								
GW-1		1300								
624		1325								
GW-2	↓	1336	↓	LKB	↓	↓	LKB			

Sampled by: [signature]
Dispatched by: [signature]
Carrier: UPS
4 ICED COOLER
Method of Shipment

Received by M. Chambly
7/14/99 2:00 pm
Date Time

7-13-99 1000 1200
Date Time

Lab Receipt Signature

07/16/99 1000
Date Time

The above analysis to be performed is authorized by:
Signature
7-14-99
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

2393 N. Salt Creek Highway
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- 5-7-99 (PG. 2 OF 2)

Sample Description	Date	Time	Filter 0.45u	PRESERVATION plain	HNO_3	H_2SO_4	$Na_2S_2O_3$	NaOH	Preserved By	Analysis Required (For all samples listed)
632	7-13-99	1345	✓	✓	✓	✓	✓			As, Be, Ca, Cd, Cl, HCO_3,
RINSATE		1355								K, Mg, Mn, Na, NH_3, Ni,
F. BLANK		1400	Broken VOA							NO_3, Pb, Pb-210, pH, Se,
GW-3		1413								SO_4, TDS, Th-230, U, V,
627		1431	Broken	VOA						Chloroform, Gross
504-B		1450								Alpha (-) U & Rn,
502-B		1506						N A		Combined Ra-226 & Ra-228, Al,
518		1520								Co, Mo
										Wells GW-3 and GW-4 require Po-210
										analysis in addition to above

Sampled by: [illegible]
Dispatched by: R Biscenti
Carrier: UPS
4 ICED COOLER
Method of Shipment

Received by M. Chidley
7/14/99 2:00pm
Date Time

7-13-99 1500
Date Time
Lab Receipt Signature
07/16/99 1000
Date Time

The above analysis to be performed is authorized by:
Signature
7-14-99
Date

Do not log for Chloroform

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

Alluvium

Energy Laboratories, Inc.
Laboratory

2393 N. Salt Creek Highway
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- 6-7-99

Sample Description	Date	Time	Filter 0.45u	PRESERVATION plain	HNO_3	H_2SO_4	$Na_2S_2O_3$	NaOH	Preserved By	Analysis Required (For all samples listed)
801	7-20-99	0830	✓	✓	✓	✓	✓			As, Be, Ca, Cd, Cl, HCO_3,
802		0820								K, Mg, Mn, Na, NH_3, Ni,
EPA-8		0924								NO_3, Pb, Pb-210, pH, Se,
EPA-9		1025								SO_4, TDS, Th-230, U, V,
EPA-4		1031								Chloroform, Gross
EPA-13		1115								Alpha (-) U & Rn,
EPA-7		1132						N A		Combined Ra-226 & Ra-228, Al,
EPA-5		1146								Co, Mo
EPA-2		1254								
EPA-28		1330								Wells GW-3 and GW-4 require Po-210
EPA-23		1350								analysis in addition to above.
EPA-14		1427								
EPA-25		1500								
NR-1		1535								
627 (RESAMPLE)		1245								

1000 1500

Sampled by: Luis A Bogart
Dispatched by: R Burkeritt 7-21-99 2:00
Date Time
Carrier: UPS
3 ICED COOLER
Method of Shipment

Received by Max Chischilly Jr.
7-20-99 1130
Date Time
Lab Receipt Signature
7/23/99 1000
Date Time

The above analysis to be performed is authorized by
Signature
7-21-99
Date

Zone 1

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

2393 N. Salt Creek Highway
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- 8-10-99

	Sample Description	Date	Time	Filter 0.45u	PRESERVATION plain	HNO_3	H_2SO_4	$Na_2S_2O_3$	NaOH	Preserved By	Analysis Required (For all samples listed)
A	802	10-12-99	0850	✓ mc	JKB	✓ mc	✓ mc	JKB			As, Be, Ca, Cd, Cl, HCO_3,
A	803		0900								K, Mg, Mn, Na, NH_3, Ni,
3	EPA-13		0920								NO_3, Pb, Pb-210, pH, Se,
	EPA-8		0938								SO_4, TDS, Th-230, U, V,
3	EPA-9		0950								Chloroform, Gross
	EPA-4		1005								Alpha (-) U & Rn,
	EPA-7		1025						N A		Combined Ra-226 & Ra-228, Al,
	EPA-5		1036								Co, Mo
	EPA-2		1316								
A	EPA-28		1338								~~Note: SW-3 and SW-4 require Fe, Mn~~
A	EPA-23		1353								~~analysis in addition to above~~
3	EPA-14		1455								
A	EPA-25		1516	✓ mc	JKB	✓ mc	✓ mc	JKB			
	ARS-A1										

Sampled by: Jeffrey H Bogard
Dispatched by: K Beaenti
Carrier: UPS
ICED COOLER
Method of Shipment

Received by Max Chischilly Jr.
10/13/99 Date
2:00pm Time

10/12/99 @1000 - 1530
Date Time

Lab Receipt Signature
10/13/99 Date
1000 Time

The above analysis to be performed is authorized by:
Signature
10-13-99
Date

TRACKING NO. PAGE NO.

33759R00007

Alluvium

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

2393 N. Salt Creek Highway
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- 7-10-99 (PG 1 OF 2)

Sample Description	Date	Time	Filter 0.45u	PRESERVATION plain	HNO_3	H_2SO_4	$Na_2S_2O_3$	NaOH	Preserved By	Analysis Required (For all samples listed)
TWQ-142	10-5-99	0833	✓ mc	LHB	✓ mc	✓ mc	LHB			As, Be, Ca, Cd, Cl, HCO_3,
TWQ-143		0845								K, Mg, Mn, Na, NH_3, Ni,
517		0916								NO_3, Pb, Pb-210, pH, Se,
614		0944								SO_4, TDS, Th-230, U, V,
515-A		0949								Chloroform, Gross
604		1001								Alpha (-) U & Rn,
619		1013								Combined Ra-226 & Ra-228, Al,
516-A		1030						N A		Co, Mo
509-D		1057								
624		1127								*~~Wells GW-3 and GW-4 require Po-210~~
RINSATE		1227								~~analysis in addition to above.~~
F. BLANK		1230								* NOT REQUIRED
632		1149								
504-B		1335								
502-B	10-5-99	1350	✓ mc	LHB	✓ mc	✓ mc	LHB			

Sampled by: [signature]
Dispatched by: KBecenti
Carrier: UPS
Method of Shipment: ICED COOLER

Received by M. Chacklly — Date 10/6/99 — Time 2:00pm

10-5-99 — Date — Time 1030-1400
Lab Receipt Signature
10/11/99 — Date — Time 1030

The above analysis to be performed is authorized by:
Signature
Date 10-6-99

TRACKING NO. 335995R00010 PAGE NO.

Alluvium

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

2393 N. Salt Creek Highway
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- 7-10-99 (PG. 2 OF 2)

Sample Description	Date	Time	Filter 0.45u	PRESERVATION plain	HNO_3	H_2SO_4	$Na_2S_2O_3$	NaOH	Preserved By	Analysis Required (For all samples listed)
518	10-5-99	1400	✓ mc	LHB	✓ mc	✓ mc	LHB			As, Be, Ca, Cd, Cl, HCO_3,
601		1415								K, Mg, Mn, Na, NH_3, Ni,
420		0900								NO_3, Pb, Pb-210, pH, Se,
GW-1		1117								SO_4, TDS, Th-230, U, V,
GW-2		1138								Chloroform, Gross
* GW-3	10-5-99	1205	✓ mc	LHB	✓ mc	✓ mc	LHB			Alpha (-) U & Rn,
627	10-5-99	1236	✓ mc	LHB	✓ mc	✓ mc	LHB	NA		Combined Ra-226 & Ra-228, Al,
										Co, Mo
										~~*Wells GW-3 and GW-4 require Po-210~~
										~~analysis in addition to above.~~
										* NOT REQUIRED

Sampled by: Gerald Bogard
Dispatched by: R Becenti
Carrier: VPS
Method of Shipment: ICED COOLER

Received by M. Chischilly
Date 10/6/99 Time 2:00 pm

10-5-99 Date 1030-1400 Time
Lab Receipt Signature
10/11/99 Date 1000 Time

The above analysis to be performed is authorized by
Signature
10-6-99 Date

33595R00011

TRACKING PAGE NO

1-99

APPENDIX C

LABORATORY QUALITY CONTROL AND PERFORMANCE REPORTS

QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: S.W. Alluvium 3rd Quarter
Laboratory ID Range: 35510-35516
Report Date: August 17, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	-	5.0	100	-	CP	08-05-99
Magnesium	EPA 200.7	-	5.9	89	-	CP	08-05-99
Sodium	EPA 200.7	-	3.1	97	-	CP	08-05-99
Potassium	EPA 200.7	-	6.3	95	-	CP	08-05-99
Bicarbonate	SM 2320 B.	-	0.3	103	-	LM	07-26-99
Sulfate	EPA 200.7	-	4.1	82	-	CP	08-05-99
Chloride	EPA 200.7	-	1.6	87	-	CP	08-05-99
Ammonium	EPA 350.1	-	0.0	103	-	RK	07-19-99
Nitrite + Nitrate	EPA 353.2	-	0.0	104	-	RK	07-22-99
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	0.4	98	-	KP	07-20-99
pH	SM 4500-H B.	-	0.3	-	-	LM	07-26-99
Trace Metals							
Aluminum	EPA 200.7	-	0.0	93	-	CP	08-05-99
Arsenic	EPA 206.3	-	0.0	90	-	MM	07-26-99
Beryllium	EPA 200.7	-	0.0	82	-	CP	08-05-99
Cadmium	EPA 200.8	100	-	100	-	SD	07-26-99
Cobalt	EPA 200.7	-	0.0	84	-	CP	08-05-99
Lead	EPA 200.7	-	0.0	82	-	CP	08-05-99
Manganese	EPA 200.7	-	0.0	89	-	CP	08-05-99
Molybdenum	EPA 200.7	-	0.0	87	-	CP	08-05-99
Nickel	EPA 200.7	-	0.0	87	-	CP	08-05-99
Selenium	EPA 270.3	-	0.0	96	-	MM	07-26-99
Vanadium	EPA 200.7	-	0.0	93	-	CP	08-05-99
Radiometrics							
Uranium	EPA 200.8	98	-	108	-	SD	07-26-99
Radium 226	EPA 903.0	-	14.0	89	-	LH	08-03-99
Radium 228	EPA 904.0	-	0.0	88	-	LH	08-06-99
Thorium 230	EPA 907.0	-	7.3	88	-	PH	07-22-99
Lead 210	NERHL-65-4	-	0.0	101	-	LH	08-02-99
Polonium 210	RMO-3008, USAEC	79	-	102	-	RS	07-22-99
Gross Alpha	EPA 900.1	100	-	96	-	RS	07-21-99
Trace Organics							
Chloroform	EPA 601	-	2.3	109	-	RO	07-20-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By: Reviewed by: RAU

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ELI

QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: 3rd Quarter Zone 1 (35518-27), Zone 3 (35528)
Laboratory ID Range: 35518-35528
Report Date: August 23, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	-	5.0	95	-	CP	08-05-99
Magnesium	EPA 200.7	-	5.9	88	-	CP	08-05-99
Sodium	EPA 200.7	-	3.1	97	-	CP	08-05-99
Potassium	EPA 200.7	-	6.3	95	-	CP	08-05-99
Bicarbonate	SM 2320 B.	-	0.3	103	-	LM	07-26-99
Sulfate	EPA 200.7	-	4.1	96	-	CP	08-05-99
Chloride	EPA 200.7	-	1.6	92	-	CP	08-05-99
Ammonia	SM 4500-NH_3 G.	-	0.0	100	-	RK	07-19-99
Nitrite + Nitrate	EPA 353.2	-	0.0	104	-	RK	07-22-99
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	0.5	101	-	KP	08-30-99
pH	SM 4500-H B.	-	0.3	-	-	LM	07-26-99
Trace Metals							
Aluminum	EPA 200.7	-	0.0	80	-	CP	08-05-99
Arsenic	EPA 206.3	-	0.0	90	-	MM	07-26-99
Beryllium	EPA 200.7	-	0.0	91	-	CP	08-05-99
Cadmium	EPA 200.8	100	-	100	-	SD	07-26-99
Cobalt	EPA 200.7	-	0.0	90	-	CP	08-05-99
Lead	EPA 200.7	-	0.0	84	-	CP	08-05-99
Manganese	EPA 200.7	-	0.0	84	-	CP	08-05-99
Molybdenum	EPA 200.7	-	0.0	92	-	CP	08-05-99
Nickel	EPA 200.7	-	0.0	95	-	CP	08-05-99
Selenium	EPA 270.3	-	0.0	96	-	MM	07-26-99
Vanadium	EPA 200.7	-	0.0	96	-	CP	08-05-99
Radiometrics							
Uranium	EPA 200.8	98	-	108	-	SD	07-26-99
Radium 226	EPA 903.0	-	14.0	89	-	LH	08-03-99
Radium 228	EPA 904.0	-	0.0	88	-	LH	08-06-99
Thorium 230	EPA 907.0	-	12.5	89	-	PH	08-10-99
Lead 210	NERHL-65-4	-	0.0	91	-	RS	08-06-99
Gross Alpha	EPA 900.1	-	0.0	102	-	RS	08-12-99
Trace Organics							
Chloroform	EPA 601	-	2.3	109	-	RO	07-21-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By: Reviewed by:

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QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: 3rd Quarter S.W. Alluvium
Laboratory ID Range: 35979-35983
Report Date: August 26, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	100	-	96	-	TS	08-09-99
Magnesium	EPA 200.7	100	-	89	-	TS	08-09-99
Sodium	EPA 200.7	100	-	98	-	TS	08-09-99
Potassium	EPA 200.7	100	-	96	-	TS	08-09-99
Bicarbonate	SM 2320 B.	-	0.2	96	-	LM	07-27-99
Sulfate	EPA 200.7	99	-	91	-	TS	08-09-99
Chloride	EPA 200.7	109	-	95	-	TS	08-09-99
Ammonium	EPA 350.1	-	0.3	108	-	RK	07-26-99
Nitrite + Nitrate	EPA 353.2	-	0.0	94	-	RK	07-28-99
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	0.0	101	-	JR	07-27-99
pH	SM 4500-H B.	-	0.2	-	-	LM	07-27-99
Trace Metals							
Aluminum	EPA 200.7	100	-	87	-	TS	08-09-99
Arsenic	EPA 206.3	-	0.0	96	-	MM	07-28-99
Beryllium	EPA 200.7	100	-	88	-	TS	08-09-99
Cadmium	EPA 200.8	100	-	102	-	SD	07-26-99
Cobalt	EPA 200.7	100	-	87	-	TS	08-09-99
Lead	EPA 200.7	100	-	84	-	TS	08-09-99
Manganese	EPA 200.7	100	-	85	-	TS	08-09-99
Molybdenum	EPA 200.7	100	-	95	-	TS	08-09-99
Nickel	EPA 200.7	100	-	86	-	TS	08-09-99
Selenium	EPA 270.3	-	0.0	98	-	MM	07-27-99
Vanadium	EPA 200.7	100	-	94	-	TS	08-09-99
Radiometrics							
Uranium	EPA 200.8	102	-	116	-	SD	07-26-99
Radium 226	EPA 903.0	-	0.0	89	-	RS	08-03-99
Radium 228	EPA 904.0	-	0.0	78	-	LH	08-18-99
Thorium 230	EPA 907.0	-	12.5	89	-	PH	08-10-99
Lead 210	NERHL-65-4	-	0.0	95	-	RS	08-04-99
Gross Alpha	EPA 900.1	-	5.0	93	-	RS	08-03-99
Trace Organics							
Chloroform	EPA 601	-	0.6	103	-	RO	07-26-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By: Reviewed by:

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Login No. 54576

ELI

QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: 3rd Quarter Zone 3
Laboratory ID Range: 35991-35993
Report Date: August 26, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	100	-	96	-	TS	08-09-99
Magnesium	EPA 200.7	100	-	89	-	TS	08-09-99
Sodium	EPA 200.7	100	-	98	-	TS	08-09-99
Potassium	EPA 200.7	100	-	96	-	TS	08-09-99
Bicarbonate	SM 2320 B.	-	0.2	96	-	LM	07-27-99
Sulfate	EPA 200.7	99	-	91	-	TS	08-09-99
Chloride	EPA 200.7	109	-	95	-	TS	08-09-99
Ammonium	EPA 350.1	-	0.3	108	-	RK	07-26-99
Nitrite + Nitrate	EPA 353.2	-	0.0	94	-	RK	07-28-99
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	0.0	101	-	JR	07-27-99
pH	SM 4500-H B.	-	0.2	-	-	LM	07-27-99
Trace Metals							
Aluminum	EPA 200.7	100	-	87	-	TS	08-09-99
Arsenic	EPA 206.3	-	0.0	96	-	MM	07-28-99
Beryllium	EPA 200.7	100	-	88	-	TS	08-09-99
Cadmium	EPA 200.8	100	-	102	-	SD	07-26-99
Cobalt	EPA 200.7	100	-	87	-	TS	08-09-99
Lead	EPA 200.7	100	-	84	-	TS	08-09-99
Manganese	EPA 200.7	100	-	85	-	TS	08-09-99
Molybdenum	EPA 200.7	100	-	95	-	TS	08-09-99
Nickel	EPA 200.7	100	-	86	-	TS	08-09-99
Selenium	EPA 270.3	-	0.0	98	-	MM	07-27-99
Vanadium	EPA 200.7	100	-	94	-	TS	08-09-99
Radiometrics							
Uranium	EPA 200.8	102	-	116	-	SD	07-26-99
Radium 226	EPA 903.0	-	0.0	89	-	RS	08-03-99
Radium 228	EPA 904.0	-	0.0	78	-	LH	08-18-99
Thorium 230	EPA 907.0	-	12.0	89	-	PH	08-10-99
Lead 210	NERHL-65-4	-	0.0	95	-	RS	08-04-99
Gross Alpha	EPA 900.1	-	5.0	93	-	RS	08-03-99
Trace Organics							
Chloroform	EPA 601	-	8.0	100	-	RO	07-26-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By:
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Reviewed by: RDH
Login No. 54581

QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: 3rd Quarter Zone 3
Laboratory ID Range: 35529-35532
Report Date: August 27, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	-	5.0	95	-	CP	08-05-99
Magnesium	EPA 200.7	-	5.9	88	-	CP	08-05-99
Sodium	EPA 200.7	-	3.1	97	-	CP	08-05-99
Potassium	EPA 200.7	-	6.3	95	-	CP	08-05-99
Bicarbonate	SM 2320 B.	-	0.3	103	-	LM	07-26-99
Sulfate, 35529, 31-32	EPA 200.7	-	4.1	96	-	CP	08-05-99
Sulfate, 35530	SM 4500-SO4 E. Mod.	-	6.0	98	-	JL	08-27-99
Chloride	EPA 200.7	-	1.6	92	-	CP	08-05-99
Ammonia	SM 4500-NH_3 G.	-	0.0	100	-	RK	07-19-99
Nitrite + Nitrate	EPA 353.2	-	0.0	104	-	RK	07-22-99
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	0.3	102	-	KP	07-20-99
pH	SM 4500-H B.	-	0.3	-	-	LM	07-26-99
Trace Metals							
Aluminum	EPA 200.7	-	0.0	80	-	CP	08-05-99
Arsenic	EPA 206.3	-	0.0	90	-	MM	07-26-99
Beryllium	EPA 200.7	-	0.0	91	-	CP	08-05-99
Cadmium	EPA 200.8	100	-	104	-	SD	07-26-99
Cobalt	EPA 200.7	-	0.0	90	-	CP	08-05-99
Lead	EPA 200.7	-	0.0	84	-	CP	08-05-99
Manganese	EPA 200.7	-	0.0	84	-	CP	08-05-99
Molybdenum	EPA 200.7	-	0.0	92	-	CP	08-05-99
Nickel	EPA 200.7	-	0.0	95	-	CP	08-05-99
Selenium	EPA 270.3	-	0.0	96	-	MM	07-26-99
Vanadium	EPA 200.7	-	0.0	96	-	CP	08-05-99
Radiometrics							
Uranium	EPA 200.8	101	-	111	-	SD	07-26-99
Radium 226	EPA 903.0	100	-	89	-	LH	08-03-99
Radium 228	EPA 904.0	-	0.0	78	-	LH	08-18-99
Thorium 230	EPA 907.0	103	-	90	-	PH	08-03-99
Lead 210	NERHL-65-4	-	0.0	91	-	LH	07-28-99
Gross Alpha	EPA 900.1	-	5.0	93	-	RS	08-03-99
Trace Organics							
Chloroform	EPA 601	-	6.7	102	-	RO	07-21-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By: Reviewed by: RAb

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Login No. 54401

QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: 3rd Quarter Zone 1
Laboratory ID Range: 35996-36001
Report Date: August 31, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	100	-	96	-	TS	08-09-99
Magnesium	EPA 200.7	100	-	89	-	TS	08-09-99
Sodium	EPA 200.7	100	-	98	-	TS	08-09-99
Potassium	EPA 200.7	100	-	96	-	TS	08-09-99
Bicarbonate	SM 2320 B.	-	0.5	100	-	LM	07-28-99
Sulfate	EPA 200.7	99	-	91	-	TS	08-09-99
Chloride	EPA 200.7	109	-	95	-	TS	08-09-99
Ammonium	SM 4500-NH_3 G.	-	0.3	108	-	RK	07-26-99
Nitrite + Nitrate	EPA 353.2	-	0.0	95	-	RK	07-28-99
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	0.0	101	-	JL	07-27-99
pH	SM 4500-H B.	-	0.0	-	-	LM	07-28-99
Trace Metals							
Aluminum	EPA 200.7	100	-	87	-	TS	08-09-99
Arsenic	EPA 206.3	-	0.0	96	-	MM	07-28-99
Beryllium	EPA 200.7	100	-	88	-	TS	08-09-99
Cadmium	EPA 200.8	100	-	104	-	SD	07-26-99
Cobalt	EPA 200.7	100	-	87	-	TS	08-09-99
Lead	EPA 200.7	100	-	84	-	TS	08-09-99
Manganese	EPA 200.7	100	-	85	-	TS	08-09-99
Molybdenum	EPA 200.7	100	-	95	-	TS	08-09-99
Nickel	EPA 200.7	100	-	86	-	TS	08-09-99
Selenium	EPA 270.3	-	0.0	98	-	MM	07-27-99
Vanadium	EPA 200.7	100	-	94	-	TS	08-09-99
Radiometrics							
Uranium	EPA 200.8	99	-	110	-	SD	07-26-99
Radium 226	EPA 903.0	-	15.0	85	-	RS	08-10-99
Radium 228	EPA 904.0	-	13.5	104	-	LH	08-12-99
Thorium 230	EPA 907.0	-	8.0	96	-	PH	08-13-99
Lead 210	NERHL-65-4	-	0.0	95	-	RS	08-04-99
Gross Alpha	EPA 900.1	-	5.0	93	-	RS	08-03-99
Trace Organics							
Chloroform	EPA 601	-	8.0	100	-	RO	07-26-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By: Reviewed by:

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Login No. 54582

QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: Zone 3 4th Quarter
Laboratory ID Range: 33594-001-005
Report Date: November 12, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	-	0.0	97	-	CP	11-03-99
Magnesium	EPA 200.7	-	0.0	95	-	CP	11-03-99
Sodium	EPA 200.7	-	0.2	92	-	CP	11-03-99
Potassium	EPA 200.7	-	2.0	93	-	CP	11-03-99
Bicarbonate	SM 2320 B.	-	0.2	100	-	LM	10-15-99
Sulfate	EPA 200.7	-	0.0	93	-	CP	11-03-99
Chloride	EPA 200.7	-	3.2	90	-	CP	11-03-99
Ammonium	SM 4500-NH_3 G.	-	0.0	101	-	RK	10-11-99
Nitrite + Nitrate	EPA 353.2	-	7.4	105	-	JR	10-15-99
PARAMETERS with 48 hour holding time							**Date/Time Analyzed**
pH	SM 4500-H B.	-	0.0	-	-	LM	10-15-99 @ 09:46
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	0.0	102	-	JR	10-13-99
Trace Metals							
Aluminum	EPA 200.7	-	0.0	93	-	CP	11-03-99
Arsenic	EPA 206.3	-	0.0	86	-	MM	10-14-99
Beryllium	EPA 200.7	-	0.0	93	-	CP	11-03-99
Cadmium	EPA 200.8	-	7.7	102	-	SD	10-22-99
Cobalt	EPA 200.7	-	0.0	91	-	CP	11-03-99
Lead	EPA 200.7	-	1.0	92	-	CP	11-03-99
Manganese	EPA 200.7	-	0.0	91	-	CP	11-03-99
Molybdenum	EPA 200.7	-	0.0	92	-	CP	11-03-99
Nickel	EPA 200.7	-	1.0	91	-	CP	11-03-99
Selenium	EPA 270.3	-	0.0	86	-	MM	10-13-99
Vanadium	EPA 200.7	-	0.0	93	-	CP	11-03-99
Radiometrics							
Uranium	EPA 200.8	-	2.2	110	-	SD	10-22-99
Radium 226	EPA 903.0	-	0.0	101	-	RS	10-27-99
Radium 228	EPA 904.0	-	0.0	119	-	LH	11-03-99
Thorium 230	EPA 907.0	-	6.2	114	-	PH	11-02-99
Lead 210	NERHL-65-4	-	0.0	113	-	LH	11-10-99
Gross Alpha	EPA 900.1	-	0.0	103	-	RS	11-02-99
Trace Organics							
Chloroform	EPA 601	-	0.2	106	-	RO	10-13-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By: STEVEN W. COWLING DATA VALIDATOR

Reviewed by:

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QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: S.W. Alluvium 4th Quarter
Laboratory ID Range: 33595-001-008
Report Date: November 16, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	-	0.0	97	-	CP	11-03-99
Magnesium	EPA 200.7	-	0.0	95	-	CP	11-03-99
Sodium	EPA 200.7	-	0.2	92	-	CP	11-03-99
Potassium	EPA 200.7	-	2.0	93	-	CP	11-03-99
Bicarbonate	SM 2320 B.	-	0.2	100	-	LM	10-15-99
Sulfate	EPA 200.7	-	0.0	93	-	CP	11-03-99
Chloride	EPA 200.7	-	3.2	90	-	CP	11-03-99
Ammonium	SM 4500-NH_3 G.	-	0.0	103	-	RK	10-11-99
Nitrite + Nitrate	EPA 353.2	-	0.0	98	-	JL	10-15-99
PARAMETERS with 48 hour holding time							**Date/Time Analyzed**
pH	SM 4500-H B.	-	0.0	-	-	LM	10-15-99 @ 12:20
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	5.8	102	-	JR	10-13-99
Trace Metals							
Aluminum	EPA 200.7	-	0.0	93	-	CP	11-03-99
Arsenic	EPA 206.3	-	0.0	94	-	MM	10-14-99
Beryllium	EPA 200.7	-	0.0	93	-	CP	11-03-99
Cadmium	EPA 200.8	-	7.7	102	-	SD	10-22-99
Cobalt	EPA 200.7	-	0.0	91	-	CP	11-03-99
Lead	EPA 200.7	-	1.0	92	-	CP	11-03-99
Manganese	EPA 200.7	-	0.0	91	-	CP	11-03-99
Molybdenum	EPA 200.7	-	0.0	92	-	CP	11-03-99
Nickel	EPA 200.7	-	1.0	91	-	CP	11-03-99
Selenium	EPA 270.3	-	0.0	86	-	MM	10-13-99
Vanadium	EPA 200.7	-	0.0	93	-	CP	11-03-99
Radiometrics							
Uranium	EPA 200.8	-	3.8	110	-	SD	10-22-99
Radium 226	EPA 903.0	-	0.0	98	-	RS	10-29-99
Radium 228	EPA 904.0	-	0.0	112	-	LH	11-03-99
Thorium 230	EPA 907.0	-	0.0	103	-	PH	11-12-99
Lead 210	NERHL-65-4	-	0.0	73	-	RS	11-10-99
Gross Alpha	EPA 900.1	-	0.0	103	-	RS	11-02-99
Trace Organics							
Chloroform	EPA 601	-	0.2	106	-	RO	10-14-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By: STEVEN W. COWLING, DATA VALIDATOR

Reviewed by: ROGER CARLING, LABORATORY SUPERVISOR

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ELI

QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: Zone 1 4th Quarter
Laboratory ID Range: 33759-001-005
Report Date: November 19, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	-	0.7	95	-	CP	11-05-99
Magnesium	EPA 200.7	-	2.5	93	-	CP	11-05-99
Sodium	EPA 200.7	-	1.2	93	-	CP	11-05-99
Potassium	EPA 200.7	-	0.0	90	-	CP	11-05-99
Bicarbonate	SM 2320 B.	-	0.0	-	-	LM	10-19-99
Sulfate	EPA 200.7	-	2.3	91	-	CP	11-05-99
Chloride	EPA 200.7	-	0.0	94	-	CP	11-05-99
Ammonium	SM 4500-NH_3 G.	-	0.0	100	-	JL	10-18-99
Nitrite + Nitrate	EPA 353.2	-	0.0	100	-	JL	10-20-99
PARAMETERS with 48 hour holding time							**Date/Time Analyzed**
pH	SM 4500-H B.	-	0.0	-	-	LM	10-19-99 @ 10:34
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	0.0	101	-	JR	10-19-99
Trace Metals							
Aluminum	EPA 200.7	-	3.0	96	-	CP	11-05-99
Arsenic	EPA 206.3	-	0.0	94	-	MM	10-19-99
Beryllium	EPA 200.7	-	1.2	91	-	CP	11-05-99
Cadmium	EPA 200.8	-	0.0	109	-	SD	10-22-99
Cobalt	EPA 200.7	-	0.0	92	-	CP	11-05-99
Lead	EPA 200.7	-	3.0	94	-	CP	11-05-99
Manganese	EPA 200.7	-	2.0	93	-	CP	11-05-99
Molybdenum	EPA 200.7	-	0.0	91	-	CP	11-05-99
Nickel	EPA 200.7	-	0.0	87	-	CP	11-05-99
Selenium	EPA 270.3	-	0.3	102	-	MM	10-18-99
Vanadium	EPA 200.7	-	1.0	93	-	CP	11-05-99
Radiometrics							
Uranium	EPA 200.8	-	1.2	117	-	SD	10-22-99
Radium 226	EPA 903.0	-	0.0	102	-	RS	11-10-99
Radium 228	EPA 904.0	-	0.0	113	-	LH	11-17-99
Thorium 230	EPA 907.0	-	13.5	97	-	PH	11-16-99
Lead 210	NERHL-65-4	-	0.0	93	-	RS	11-17-99
Gross Alpha	EPA 900.1	-	5.8	101	-	RS	11-08-99
Trace Organics							
Chloroform	EPA 601	-	0.5	107	-	RO	10-19-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By: STEVEN W. COWLING DATA VALIDATOR

Reviewed by: ROGER GARCIA LABORATORY SUPERVISOR

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ELI

QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: Zone 3 4th Quarter
Laboratory ID Range: 33758-001-003
Report Date: November 24, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	-	0.7	95	-	CP	11-05-99
Magnesium	EPA 200.7	-	2.5	93	-	CP	11-05-99
Sodium	EPA 200.7	-	1.2	93	-	CP	11-05-99
Potassium	EPA 200.7	-	0.0	90	-	CP	11-05-99
Bicarbonate	SM 2320 B.	-	0.8	-	-	LM	10-19-99
Sulfate	EPA 200.7	-	2.3	91	-	CP	11-05-99
Chloride	EPA 200.7	-	0.0	94	-	CP	11-05-99
Ammonium	SM 4500-NH_3 G.	-	0.0	100	-	JL	10-18-99
Nitrite + Nitrate	EPA 353.2	-	0.0	100	-	JL	10-20-99
PARAMETERS with 48 hour holding time							**Date/Time Analyzed**
pH	SM 4500-H B.	-	0.8	-	-	LM	10-19-99 @ 09:30
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	0.0	107	-	JR	10-19-99
Trace Metals							
Aluminum	EPA 200.7	-	3.0	96	-	CP	11-05-99
Arsenic	EPA 206.3	-	0.0	94	-	MM	10-19-99
Beryllium	EPA 200.7	-	1.2	91	-	CP	11-05-99
Cadmium	EPA 200.8	-	0.0	109	-	SD	10-22-99
Cobalt	EPA 200.7	-	0.0	92	-	CP	11-05-99
Lead	EPA 200.7	-	3.0	94	-	CP	11-05-99
Manganese	EPA 200.7	-	2.0	93	-	CP	11-05-99
Molybdenum	EPA 200.7	-	0.0	91	-	CP	11-05-99
Nickel	EPA 200.7	-	0.0	87	-	CP	11-05-99
Selenium	EPA 270.3	-	0.3	102	-	MM	10-18-99
Vanadium	EPA 200.7	-	1.0	93	-	CP	11-05-99
Radiometrics							
Uranium	EPA 200.8	-	1.2	117	-	SD	10-22-99
Radium 226	EPA 903.0	-	0.0	102	-	RS	11-10-99
Radium 228	EPA 904.0	-	0.0	113	-	LH	11-17-99
Thorium 230	EPA 907.0	-	13.5	97	-	PH	11-16-99
Lead 210	NERHL-65-4	-	0.0	97	-	LH	11-19-99
Gross Alpha	EPA 900.1	-	5.8	101	-	RS	11-08-99
Trace Organics							
Chloroform	EPA 601	-	0.5	107	-	RO	10-19-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By: STEVEN W. COWLING, DATA VALIDATOR

Reviewed by: ROGER GARLING, LABORATORY SUPERVISOR

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33758R00004

ELI

QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: S.W. Alluvium 4th Quarter
Laboratory ID Range: 33757-001-005
Report Date: November 29, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	-	0.7	95	-	CP	11-05-99
Magnesium	EPA 200.7	-	2.5	93	-	CP	11-05-99
Sodium	EPA 200.7	-	1.2	93	-	CP	11-05-99
Potassium	EPA 200.7	-	0.0	90	-	CP	11-05-99
Bicarbonate	SM 2320 B.	-	0.8	-	-	LM	10-19-99
Sulfate	EPA 200.7	-	2.3	91	-	CP	11-05-99
Chloride	EPA 200.7	-	0.0	94	-	CP	11-05-99
Ammonium	SM 4500-NH_3 G.	-	0.0	100	-	JL	10-18-99
Nitrite + Nitrate	EPA 353.2	-	0.0	100	-	JL	10-20-99
PARAMETERS with 48 hour holding time							**Date/Time Analyzed**
pH	SM 4500-H B.	-	0.8	-	-	LM	10-19-99 @ 09:07
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	0.3	107	-	JL	10-19-99
Trace Metals							
Aluminum	EPA 200.7	-	3.0	96	-	CP	11-05-99
Arsenic	EPA 206.3	-	0.0	94	-	MM	10-19-99
Beryllium	EPA 200.7	-	1.2	91	-	CP	11-05-99
Cadmium	EPA 200.8	-	0.0	109	-	SD	10-22-99
Cobalt	EPA 200.7	-	0.0	92	-	CP	11-05-99
Lead	EPA 200.7	-	3.0	94	-	CP	11-05-99
Manganese	EPA 200.7	-	2.0	93	-	CP	11-05-99
Molybdenum	EPA 200.7	-	0.0	91	-	CP	11-05-99
Nickel	EPA 200.7	-	0.0	87	-	CP	11-05-99
Selenium	EPA 270.3	-	0.3	102	-	MM	10-18-99
Vanadium	EPA 200.7	-	1.0	93	-	CP	11-05-99
Radiometrics							
Uranium	EPA 200.8	-	1.2	117	-	SD	10-22-99
Radium 226	EPA 903.0	-	0.0	102	-	RS	11-10-99
Radium 228	EPA 904.0	-	0.0	113	-	LH	11-17-99
Thorium 230	EPA 907.0	-	13.5	97	-	PH	11-16-99
Lead 210	NERHL-65-4	-	0.0	97	-	RS	11-19-99
Gross Alpha	EPA 900.1	-	5.8	101	-	RS	11-08-99
Trace Organics							
Chloroform	EPA 601	-	0.5	107	-	RO	10-19-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By: Steven W. Cowling, Data Validator

Reviewed by: Roger Gamble, Technical Supervisor

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ELI

QUALITY ASSURANCE REPORT - UNC MINING & MILLING

Project: Zone 1 4th Quarter
Laboratory ID Range: 33596-001-009
Report Date: December 1, 1999

Major Ions	Method	Duplicate[1] #1 %	RPD[2] %	Spike[3] #1 %	Spk #2 %	Analyst	Date Analyzed
Calcium	EPA 200.7	-	0.0	97	-	CP	11-03-99
Magnesium	EPA 200.7	-	0.0	95	-	CP	11-03-99
Sodium	EPA 200.7	-	0.2	92	-	CP	11-03-99
Potassium	EPA 200.7	-	2.0	93	-	CP	11-03-99
Bicarbonate	SM 2320 B.	-	0.7	-	-	LM	10-18-99
Sulfate	EPA 200.7	-	0.0	93	-	CP	11-03-99
Chloride	EPA 200.7	-	3.2	90	-	CP	11-03-99
Ammonium	SM 4500-NH_3 G.	-	0.0	103	-	RK	10-11-99
Nitrite + Nitrate	EPA 353.2	-	7.4	105	-	JR	10-15-99
PARAMETERS with 48 hour holding time							**Date/Time Analyzed**
pH	SM 4500-H B.	-	0.7	-	-	LM	10-18-99 @ 10:58
Non-Metals							
TDS @ 180 °C	SM 2540 C. Mod.	-	5.8	100	-	JR	10-13-99
Trace Metals							
Aluminum	EPA 200.7	-	0.0	93	-	CP	11-03-99
Arsenic	EPA 206.3	-	0.0	97	-	MM	10-14-99
Beryllium	EPA 200.7	-	0.0	93	-	CP	11-03-99
Cadmium	EPA 200.8	-	0.0	108	-	SD	10-22-99
Cobalt	EPA 200.7	-	0.0	91	-	CP	11-03-99
Lead	EPA 200.7	-	1.0	92	-	CP	11-03-99
Manganese	EPA 200.7	-	0.0	91	-	CP	11-03-99
Molybdenum	EPA 200.7	-	0.0	92	-	CP	11-03-99
Nickel	EPA 200.7	-	1.0	91	-	CP	11-03-99
Selenium	EPA 270.3	-	0.0	98	-	MM	10-13-99
Vanadium	EPA 200.7	-	0.0	93	-	CP	11-03-99
Radiometrics							
Uranium	EPA 200.8	-	2.3	112	-	SD	10-22-99
Radium 226	EPA 903.0	-	0.0	98	-	RS	10-29-99
Radium 228	EPA 904.0	-	0.0	112	-	LH	11-03-99
Thorium 230	EPA 907.0	-	0.0	90	-	PH	11-24-99
Lead 210	NERHL-65-4	-	0.0	103	-	LH	11-12-99
Gross Alpha	EPA 900.1	-	0.0	107	-	RS	10-29-99
Trace Organics							
Chloroform	EPA 601	-	0.2	106	-	RO	10-14-99

NOTES:

(1) These values are an assessment of analytical precision. They are a percent recovery of the original result. ELI duplicates 10 percent of all samples for each analytical method.

(2) These values are an assessment of analytical precision. The acceptance range is 0-20% for sample results above 10 times the reporting limit. This range is not applicable to samples with results below 10 times the reporting limit.

(3) These values are an assessment of analytical accuracy. They are a percent recovery of the spike addition. ELI performs a matrix spike on 10 percent of all samples for each analytical method.

Report Approved By: STEVEN W. COMLING DATA VALIDATOR

Reviewed by: ROGER GAPLINO

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