

# UNITED NUCLEAR CORPORATION

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January 30, 2012

Mr. Jack E. Whitten, Chief  
US Nuclear Regulatory Commission, Region IV  
Division of Nuclear Materials Safety Branch B  
612 East Lamar Blvd, Suite 400  
Arlington, TX 76011-4125

Dear Mr. Whitten:

Pursuant to our License SUA-1475, submitted herewith are the results of our Annual ALARA Audit conducted on December 2, 2011.

If you have any questions, please advise.

Sincerely,

A handwritten signature in black ink, appearing to read 'Larry Bush', written over a white background.

Larry Bush  
Manager

Cc: Steve Hill, GE  
Roy Blickwedel, GE  
Keith I. McConnell, USNRC  
Yolande Norman, US NRC

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To: File January 30, 2012  
From: Max Chischilly Jr., RSO  
Subject: ALARA Committee Meeting and Audit conducted on December 2, 2011

The UNC Mining and Milling ALARA Committee met on December 2, 2011 to audit the result of the radiological monitoring program for the fourth quarter of 2010 and the first three quarters of data for 2011. Current committee members are: Larry Bush, Manager, and Max Chischilly Jr., Radiation Safety Officer. The Committee reviewed Mr. Chischilly's Annual Report entitled "Environmental and Personnel Monitoring Program for Inactive Status Report from 4<sup>th</sup> Qr. 2010 to 3<sup>rd</sup> Qr. 2011.

#### Significant Finding and Event:

1. No radiation exposure was recorded for United Nuclear Corp. (UNC) employees, contractors, and the public due to our current site status conditions.
2. Training and refresher training of employees on radiation protection and safety was done in 2011 as required.
3. All documentation and monitoring required by our radiation protection program and NRC License was in order for 2011.
4. Available GW-3 well data for this Report is also reported as per suggested format in Regulatory Guide 4.14 (see attached Table-1 on pg. 8 of 8).
5. The annual land use survey was done on 3-30-11 for 2010 (see report for findings).
6. The environmental monitoring program is limited and the reported items in the Environmental Monitoring Summary Data (pg. 4 of 8) are solely based on available data. The only required radiation-monitoring program will be under an RWP (Radiation Work Permit), in pg 5 of 8 of this report and no RWP was issued during this annual period.
7. The active radiation monitoring instruments are routinely calibrated and the Personnel Radiation Monitoring program under RWP is still in effect, but is in a standby status awaiting the final pond closure reclamation activity (see also pg. 5 of 8).

8. (Continual monthly and/or quarterly monitoring is ongoing for well NBL-1, NBL-2, PB-2, PB-3, PB-4, RW-A and NW well series (1 thru 5) to track the northern most migration extent of the seepage impacted water or plume in Zone 3. Also note that beginning July 9, 2011 well MW-6 and MW-7 are added to the monthly monitoring program.

9. (Continual pumping/extraction is ongoing in the Zone 3 seepage impacted water area for well RW-11, RW-16, RW-A, PB-2, NW-1, NW-2 and NW-4. The pumped water is discharged into the tailings North Evaporation Pond.

10. Ms. Linda Jersey identified no violations or deviations on a routine NRC inspection conducted on August 18, 2011.

11. The June 28, 2010 installed injection well IW-A on UNC'S Sec. 36, northern most Zone 3 seepage impacted area, just north of the pumping wells (NW-1, NW-2, NW-4) was brought online on April 18, 2011. Water is supplied to this well via domestic mill well (i.e. thru a driscoc pipeline connections to a close proximity recently installed collection tank where sodium bicarbonate is added/mixed and gravity fed to well). The objective of this pilot test (SWSFS) to inject alkalinity-amended water is to increase ground water PH in Zone3 and increase the saturated thickness in the pumping wells to extend their productivity and lifespan.

12. Based on the routine annual ALARA committee meeting and audit on December 2, 2011; the program has met the requirement under 10 CFR Part 20, Subpart G – Radiation Protection Programs, Sec. 20.1101 ( c ).





#### Past Significant Events:

1. The Mill Site was released from a restricted to unrestricted area by License # SUA-1475 Amendment # 21 in 1995.
2. The final tailings reclamation was completed in 1995. The last of the drainage channels were completed in 1996. The reclamation of evaporation ponds is being delayed until the ground water Corrective Action Plan is deemed completed by the NRC and EPA.
3. The radon cap covers was completed in 1996 with exception of the lined evaporation ponds.
4. The report submitted January 03, 1997 and on January 13, 1998 on Radon Emanation Testing of UNC's Church Rock Tailings Site shows the average Radon Flux to be 5.67 pci m<sup>2</sup>sec., which is less than the allowable of 20.0 pci m<sup>2</sup>sec.



UNC MINING AND MILLING  
ENVIRONMENTAL SURVEILLANCE

Monitoring Program

- \* 1. The Radiation Safety Officer (RSO) inspects the restricted areas monthly.
- \* 2. Air sampling is continuously done at four locations; one located upwind of the tailings impoundment, two located downwind of the tailings impoundment, and one background sampling location (see EMP-2).
- \* 3. Gamma exposure is continuously monitored with TLDs at the same four locations as the air sampling. The TLDs are changed out and analyzed semi-annually (See Procedure EMP-3).
- \* 4. Ambient radon is continuously monitored with radon detectors at the same sites as air sampling. The detectors are changed out and analyzed quarterly and reported semi-annually (see Procedure EMP-4).
- \* 5. Groundwater samples are collected and analyzed quarterly at two locations near tailings, and one domestic water well at the mill site (see Procedures EMP-5 and EMP-5a).
- 6. Equipment being sold or for other purposes, leaving the restricted area is surveyed for compliance with guidelines for release to unrestricted use (see Procedure EMP-8A).
- \* 7. An Effluent Report will be submitted semi-annually within 60 days of each six-month period. All of the Environmental Monitoring Program data is included in this report, with the exception of the equipment surveys (see EMP-9).

Note: The above (\*) marked items are deleted as per NRC approved License amendment 29 dated 6-18-99 deleting condition's #16, #22, and #28.

Additional Note: Item #1 procedure is continued on 10-19-99, to show and maintain the integrity of the restricted tailings area. Effluent Report under Item #7 is reported when pertinent data is available.

*May Chaschally Jr. 4/19/11* *May Chaschally Jr. 4/20/12* *May Chaschally Jr. 1/7/09* *May Chaschally Jr. 1/9/10*  
*May Chaschally Jr. 4/28/02* *May Chaschally Jr. 1-20-03* *May Chaschally Jr. 1/17/05*  
*May Chaschally Jr. 4/29/01* *M. Chaschally 1/22/99* *May Chaschally Jr. 4/24/06*  
*May Chaschally Jr. 4/20/00* *May Chaschally Jr. 1-20-04* *May Chaschally Jr. 4/25/07*  
*Estimate 1/17/98* *Estimate 1/22/98* *May Chaschally Jr. 4/28/08*



UNC MINING AND MILLING  
PERSONNEL RADIATION PROTECTION PROGRAM

External Exposure Monitoring

1. Employees working within the tailings area wear a TLD badge which is changed out and analyzed semi-annually. (See Procedure PMP-2).

Internal Exposure Monitoring

2. Self-monitoring Alpha survey is done by employees working within the tailings area daily prior to leaving the area with occasional spot checks by the RSD or the Radiation Technician (see Procedure PMP-4).
3. Bioassays are done on employees working within the tailings area semi-annually (See Procedure PMP-5).
4. Continuous air samples are taken in the general tailings working area of employees for the purpose of calculating exposures (see Procedure PMP-6).
5. Surface surveys of eating areas, change room benches, and labs are done monthly.
6. TLD, bioassays and air samples will also be done under the RWP program (see Procedure PMP-9).
7. Instrumentation and calibration (see Procedure PMP-10).

\*NOTE Rev. 4, PMP

Personnel Radiation Monitoring, 1 through 6, to be done as needed under an RWP.

*Max Chisnelly Jr. 1/4/10*  
*Max Chisnelly Jr. 1/7/09*  
*Max Chisnelly Jr. 1/28/08*  
*E/Moak*  
*1/15/07*  
*1/20/05 E/Moak*

*Max Chisnelly Jr. 1/19/11*  
*Max Chisnelly Jr. 1/25/07*  
*E/Moak*  
*1/20/07*  
*1/22/98 E/Moak*  
*Max Chisnelly Jr. 1/20/12*

*Max Chisnelly Jr. 1/24/06*  
*Max Chisnelly Jr. 1/17/05*  
*Max Chisnelly Jr. 1/22/99*  
*Max Chisnelly Jr. 1/20/00*  
*Max Chisnelly Jr. 1/24/01*  
*Max Chisnelly Jr. 1/28/02*  
*Max Chisnelly Jr. 1/20/03*  
*Max Chisnelly Jr. 1-20-04*



ENVIRONMENTAL MONITORING SUMMARY DATA  
FROM 4<sup>TH</sup> QUARTER 2010 TO 3<sup>RD</sup> QUARTER 2011

Environmental Monitoring	Required Analysis:	Highest Result Obtained:	Allowable:
1. Quarterly Ground Water GW-Wells: (NOTE: Available data is on GW-3 Well)	U-Nat (mg/l)	0.236 (dissolved or total)	0.30 (NRC) 5.0 (EPA)
	TH-230 (pci/l)	0.08 (dissolved or total)	5.0 (NRC)
	RA-226 (pci/l)	0.10 (dissolved or total)	5.0 with RA-228 (NRC & EPA)
	PB-210 (pci/l)	2.70 (dissolved or total)	1.0 (NRC)
	PH (units)	6.55 (lowest)	6 – 9 (NMED)
2. Surface Alpha and Gamma:	Any Material or Equipment released, will meet the requirements for unrestricted use.		a. Removable is 1000 dpm 100 cm <sup>2</sup>  b. Fixed average is 5000 dpm 100 cm <sup>2</sup> where area is not greater than 1m <sup>2</sup>  c. Gamma is 40 ur/hr
3. Monthly Inspection Findings:			a. Flood events during July, August and September 2011 had slightly damaged the reclaimed tailings perimeter fence line at the bottom of pipeline arroyo areas (i.e. near main entrance gate and SW end) and repair work was completed in September, 2011 after the rainy season. Continual surveillance was ongoing to keep out livestock and unauthorized entry. b. All other months checked OK.





PERSONNEL MONITORING SUMMARY DATA  
 FROM 4<sup>TH</sup> QUARTER 2010 TO 3<sup>RD</sup> QUARTER 2011

Personnel Monitoring Items:	Required Analysis:	Highest Result Obtained:	Allowable:
1. Semi-Annual or as needed personnel TLD (DDE)	Gamma (rem) yr	NM	0.500 (Action Level)
2. Semi-Annual or as needed Bioassay	Total Uranium (ug) l	NM	15-35 (Action Level)
3. Bi-Weekly or Quarterly air sample	Gross Alpha (uci) ml	NM	6E - 11 (DAC)
(Also note: Action Level is 10 % of an applicable dose limit)	TH-230 (uci) ml	NM	6E - 12 (DAC)
	RA-226 (uci) ml	NM	3E - 10 (DAC)
	PB-210 (uci) ml	NM	1E - 10 (DAC)
	RN-222 (uci) ml	NM	4E - 6 (DAC)
	(-Daughter)		
	U-Nat (uci) ml	NM	2E - 11 (DAC)
Personnel Exposure:			
4. Estimated Annual Total Effective Dose Equivalent (TEDE):	TEDE (rem)	NM	5.0 (MAX.) 2.0 (Action Level)

NOTE: The above items are only required under an RWP as needed (see PMP, Rev. 4 on page 5 of 8). And no RWP was issued during this reporting period.

NM – Not Monitored

**TABLE - 1**  
**QUARTERLY LIQUID SAMPLES**

<u>Date/Qr.</u>	<u>Location</u>	<u>Type</u>	<u>Radionuclide</u>	<u>Concentration</u>		<u>Error Est.</u>	<u>LLD</u>
				<u>Mg/l</u>	<u>µci/ml</u>	<u>µci/ml</u>	<u>µci/ml</u>
<u>4th-Qr. 2010</u>	<u>GW-3</u>	<u>Ground</u>	U-Nat (dissolved) or total		<u>1.60E-07</u>		<u>2.00E-10</u>
<u>to 3rd-Qr. 2011</u>		<u>Water Well</u>					
<u>Highest Result</u>			Th-230 (dissolved) or total		<u>8.00E-11</u>	<u>1.00E-10</u>	<u>2.00E-10</u>
			Ra-266 (dissolved) or total		<u>1.00E-10</u>	<u>1.00E-10</u>	<u>2.00E-10</u>
UNC Field Data	PH (STD. Units) = <b>6.55</b> Cond. (µ MHOS) = <b>5,530</b> Water Depth (Ft) = <b>53.75</b> Temp. (°C) = <b>18.0</b>		Pb-210 (dissolved) or total		<u>2.70E-09</u>	<u>1.00E-09</u>	<u>1.00E-09</u>
			Po-210 (dissolved) or total		<u>Not Monitored</u>		<u>1.00E-09</u>

COMMENTS:

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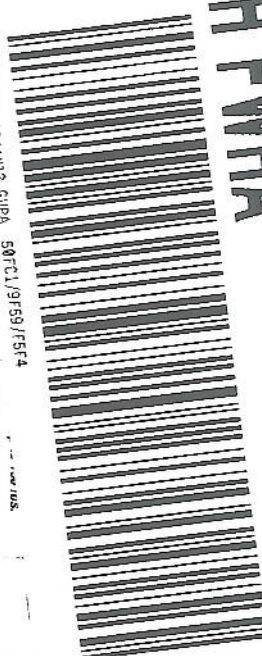
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