

# UNITED NUCLEAR CORPORATION



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January 15, 2009

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

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JAN 16 2009

DNMS

Dear Mr. Whitten:

Pursuant to our License SUA-1475, submitted herewith are the result of our Annual ALARA Audit conducted on December 11, 2008.

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  
Mike Fliegel, US NRC

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To: File January 15, 2009  
From: Max Chischilly Jr., RSO  
Subject: ALARA Committee Meeting and Audit conducted on December 11, 2008

The UNC Mining and Milling ALARA Committee met on December 11, 2008 to audit the result of the radiological monitoring program for the fourth quarter of 2007 and the first three quarters of data for 2008. 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. 2007 to 3<sup>rd</sup> Qr. 2008.

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 2008 as required.
3. All documentation and monitoring required by our radiation protection program and NRC License was in order for 2008.
4. Available 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 3-28-08 for 2007. Significant change or event include:
  - a. No change in the number of residential home sites and land ownership.
  - b. The In-Situ Alkalinity Stabilization Pilot Study monitoring activities on Sec. 36, which began during the month of October 2006 had concluded during the week of February 15, 2007 with negative results (i.e. use of alkalinity rich solutions to remediate Zone 3 impacted ground water in-situ was not feasible due to unexpected low injection and extraction well flow rates which would prolong the projected remedy goal of 5 years to 50 years).



- c. Between May and July 2007, a soil removal action was done at five home sites located in the northern most portion of 2-mile radius (close proximity to Sec.35 northern boundary line, UNC and Quivira mine sites). This project was based on the UNC NECR Mine – Removal Site Evaluation Result (i.e. a radiological field investigation conducted by a multi-agency team between August and December 2006 and the lead agency is USEPA-Region 9). The excavated soil (approximately 8,800 tons) was stock piled at NECR-1 mine site and later transported to a designated off site commercial TSD facility (US Ecology Idaho Inc. of Grand View, ID) from August 20, 2007 to September 11, 2007.
  - d. Monitoring well NBL – 2 and extraction well RW-A were drilled/installed in Zone3 plume area (Sec.36) during the month of March 2007.
  - e. Approximately 31,200 feet of fence line construction to restrict access to the UNC – NECR Mine Site reclamation project areas (on Section 35, 36 and 3) was completed during the month of February 2007.
6. The environmental monitoring program is limited and the reported items in the Environmental Monitoring Summary Data (pg. 6 of 8) are solely based on available data. The only required radiation monitoring program will be under an RWP (Radiation Work Permit), 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 monitoring is ongoing for well NBL-1, NBL-2, PB-2, PB-3, PB-4, and RW-A to track and locate the northern most migration extent of the seepage impacted water or plume in Zone 3. Also note that beginning Jan. 2008, extraction well RW-A and monitoring well NBL-2 are added to the monthly monitoring program and monitoring well 504-B is deleted.
  9. Continual pumping/extraction is ongoing in the Zone 3 plume area for well RW-11, RW-16, RW-A and PB-2. The pumped water is discharged into the tailings North Evaporation Pond. Also, other pumping wells (RW-12, RW-13, RW-15 and RW-17) are currently inactive.
  10. Extraction wells NW-1, NW-2, NW-3, NW-4 and NW-5 were drilled/installed on UNC's Sec. 36, Zone 3 plume area during the month of September 2008. These wells are currently inactive due to pending electrical hook up.
  11. Based on the routine annual ALARA committee meeting and audit on December 11, 2008; 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 drainage channels was 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 the 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 5.71 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.

*Max Chischilly Jr. 1/28/02      Max Chischilly Jr. 1/7/09*  
*Max Chischilly Jr. 1/29/01      Max Chischilly Jr. 1-20-03      Max Chischilly Jr. 1/17/05*  
*Max Chischilly Jr. 1/20/00      M. Chischilly 1/22/99      Max Chischilly Jr. 1/24/06*  
*E. Morante 1/19/95      E. Morante 1/20/97      Max Chischilly Jr. 1/25/07*  
*E. Morante 1/20/96      E. Morante 1/22/98      Max Chischilly Jr. 1/28/08*

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 RSO 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 Chiswell Jr. 1/7/09*  
*Max Chiswell Jr. 1/28/08*  
*E. Munk*  
*1/19/95*  
*1/20/96*  
*E. Munk*

*Max Chiswell Jr. 1/25/07*  
*ED Munk*  
*1/20/97*  
*1/22/98*  
*E. Munk*

*Max Chiswell Jr. 1/24/06*  
*Max Chiswell Jr. 1/17/05*  
*M. Chiswell 1/22/99*  
*Max Chiswell 1/20/00*  
*Max Chiswell 1/29/01*  
*Max Chiswell Jr. 1/28/02*  
*Max Chiswell Jr. 1/20/03*  
*Max Chiswell Jr. 1-20-04*

**ENVIRONMENTAL MONITORING SUMMARY DATA  
FROM 4TH QUARTER 2007 TO 3RD QUARTER 2008**

Environmental Monitoring:	Required Analysis:	Highest Result Obtained:	Allowable:
1. Quarterly Ground Water GW-Wells: (NOTE: Available data is on GW-3 Well)	U-Nat ( $\frac{\text{mg}}{\text{l}}$ )	0.136 (dissolved or total)	0.30 (NRC) 5.0 (EPA)
	Th-230 ( $\frac{\text{pci}}{\text{l}}$ )	0.10 (dissolved or total)	5.0 (NRC)
	RA-226 ( $\frac{\text{pci}}{\text{l}}$ )	0.22 (dissolved or total)	5.0 with RA-228 (NRC & EPA)
	PB-210 ( $\frac{\text{pci}}{\text{l}}$ )	1.30 (disolved or total)	1.0 (NRC)
	PH (units)	6.62	6 - 9 (NMED)
2. Surface Alpha:	Any Material or Equipment released, will meet the requirements for unrestricted use.		a. Removable is $1000 \frac{\text{dpm}}{100 \text{ cm}^2}$ b. Fixed average is $5000 \frac{\text{dpm}}{100 \text{ cm}^2}$ where area is not greater than $1\text{m}^2$ c. Gamma is 40 ur/hr
3. Monthly Inspection Findings:			
	a. Flood events on 7/20/08 and 8/29/08 had slightly damaged the perimeter fenceline (located on UNC's Sec. 2 northernmost boundary line areas) and repair work was completed on 12/5/08. Continual survelliance was ongoing to keepout livestock and unauthorized entry.		
	b. All other months checked OK.		



**PERSONNEL MONITORING SUMMARY DATA  
FROM 4TH QUARTER 2007 TO 3RD QUARTER 2008**

Personnel Monitoring Items:	Required Analysis:	Highest Result Obtained:	Allowable:
1. Semi-Annual or as needed personnel TLD (DDE)	Gamma ( $\frac{\text{rem}}{\text{yr}}$ )	NM	0.500 (Active Level)
2. Semi-Annual or as needed Bioassay:	Total Uranium ( $\frac{\text{ug}}{\text{l}}$ )	NM	15-35 (active Level)
3. Bi-Weekly or Quarterly air sample	Gross Alpha ( $\frac{\text{uci}}{\text{ml}}$ )	NM	$6\text{E}^{-11}$ (DAC)
(Also Note: Action Level is 10% of an application doses limit)	Th-230 (uci)/ml	NM	$6\text{E}^{-12}$ (DAC)
	RA-226 ( $\frac{\text{uci}}{\text{ml}}$ )	NM	$3\text{E}^{-10}$
	PB-210 ( $\frac{\text{uci}}{\text{ml}}$ )	NM	$1\text{E}^{-10}$ (DAC)
	RN-222 ( $\frac{\text{uci}}{\text{ml}}$ )	NM	$4\text{E}^{-6}$ (DAC)
	(-Daughter)		
	U-Nat ( $\frac{\text{uci}}{\text{ml}}$ )	NM	$2\text{E}^{-11}$ (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). And no RWP was issued during this reporting period.

NM - Not Monitored

QUARTERLY LIQUID SAMPLES

TABLE - 1

<u>Date/Qt.</u>	<u>Location</u>	<u>Type</u>	<u>Radionuclide</u>	<u>Concentration</u> Mg/l	<u>µci/ml</u>	<u>Error Est.</u> µci/ml	<u>LLD</u> µci/ml
<u>4th-Qr.2007</u>	<u>GW-3</u>	<u>Ground</u>	<u>U-Nat (dissolved)</u> or total		<u>9.21E-08</u>		<u>2.00E-10</u>
<u>to 3rd-Qr.</u>		<u>Water Well</u>					
<u>2008 Highest</u>			<u>Th-230 (dissolved)</u> or total		<u>1.00E-10</u>	<u>4.00E-10</u>	<u>2.00E-10</u>
<u>Result</u>							
UNC Field Data:							
			<u>Ra-226 (dissolved)</u> or total		<u>2.20E-10</u>	<u>1.30E-10</u>	<u>2.00E-10</u>
			<u>Pb-210 (dissolved)</u> or total		<u>1.30E-09</u>	<u>4.70E-09</u>	<u>1.00E-09</u>
			<u>Po-210 (dissolved)</u> or total		<u>Not Monitored</u>		<u>1.00E-09</u>

PH (STD. Units) = 6.62  
 Cond. (µ MHOS) = 5,430  
 Water Depth (Ft.) = 51.85  
 Temp. (°C) = 17.9

COMMENTS:

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