PDR - RETURN 396-55
40-8728

04008728090E

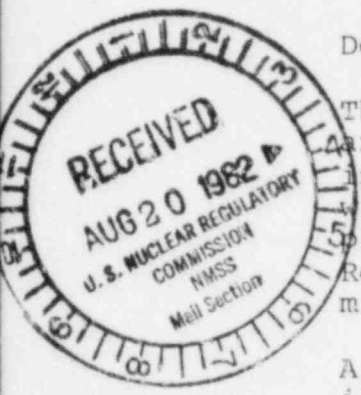
UNC TETON EXPLORATION DRILLING, INC.

Subsidiary of United Nuclear Corporation
A UNC RESOURCES Company
P.O. Drawer A-1
Casper, Wyoming 82602
Telephone 307/265-4102

July 19, 1982

Mr. Ross A. Scarano
Uranium Recovery Licensing Branch
Division of Waste Management
U. S. Nuclear Regulatory Commission
Mail Stop 461-SS
7915 Eastern Avenue
Silver Springs, Maryland 20910

RE: Docket No. 40-8728



Dear Ross:

The purpose of this transmittal is to request a minor safety and environmental amendment to the above-referenced license in order to reduce compliance requirements to a level consistent with the activity level at the Leuenberger site and in the plant during the interim period between the now concluded Research and Development activities and the eventual commercial mining activities or a final site decommissioning.

A check in the amount of seven-hundred-sixty dollars ($760.00) is attached to cover the amendment fee as specified in Section 170.31 (2B) of 10 CFR 170.

Items of major concern are the radiological environmental monitoring programs required by Stipulation 29, and the in-plant radiation safety program required by Stipulation 30a-. It also goes without saying that since the Wellfield and plant have been shut down and decontaminated which required a considerable degree of disassembly in the plant, no mining or processing operations can take place; therefore, any operational monitoring and reporting requirements should be suspended at this time. Data, herein, is presented in three parts: 1) Details of the decontamination activities, 2) proposed plant use and in-plant radiation monitoring during the interim period, and 3) disposal summary and survey results.

Sincerely yours,

UNC TETON EXPLORATION DRILLING, INC.

Richard R. Appel

R. R. Appel
Coordinator - Licensing and Permits

Applicant	
Check No.	2346.5
Amount/Fee Category	$760. 2B.
Type of Fee	minor amend
Date Check Rec'd.	8/11/82
Received By	Helen Hughes

RRA/mdd
Attachment

8209140035 820719
PDR ADOCK 04008728
C PDR

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Amendment

PART 1
DECONTAMINATION ACTIVITIES AT THE
TETON LEUENBERGER IN SITU SITE
CONVERSE COUNTY, WYOMING

Preparation for the Leuenberger Site decontamination and decommissioning for an interim period began February 1981 as a result of completion of research and development activities, uranium market conditions and pending commercial operating licenses. Teton scheduled an extensive radiation decontamination and clean-up period to coincide with and follow the completion of aquifer restoration which was the last phase of the R & D plant operations. The purpose of the decontamination program was to render the site area and plant building safe for wildlife, livestock, company personnel and anyone else who might be on site or in the plant building, in order to be able to leave the site unattended for periods of time during the interim. This report summarizes major activities carried out in the plant at the Leuenberger facility to ensure good decontamination.

No major spills occurred during the research and development mining and restoration operations at the site; therefore, the major areas needing decontamination were contained within the plant building and solar evaporation ponds.

Liquid Wastes

The decontamination programs beginning with the initiation of M Zone restoration using an Ionics reverse polarity electrodialysis unit which concentrated chemical parameters from the wellfield recovery

solution in approximately 15 to 20 percent of the volume of water circulated. This concentrated solution was temporarily ponded in the south solar evaporation pond from February through May 1981 as a restoration brine. Due to the desire to leave only relatively clean water in the evaporation ponds during the interim period, this brine water was withdrawn from the ponds in June and July 1981 and hauled to a licensed disposal facility. For the remainder of restoration, all brines and other liquid waste generated from restoration and decontamination program were held in outside storage tanks and hauled daily to the disposal facility. A record of the material and waste waters transported to the disposal facility is attached.

Pond Condition

Due to the uncertainties of the integrity of the bottom of the south pond, an additional liner was placed in the pond base extending approximately one-half the distance up each side where it was sealed to the original liner. Water generated in the N Zone sweep restoration effort which had been held entirely in the north solar evaporation pond was split between the two ponds to hold the liners in place to prevent liner damage by wind during the interim period.

Solid Waste

Contaminated equipment and piping which had been held in the site storage yard along with other solid waste were transferred to a licensed disposal facility for burial. Materials hauled included drums, used filter cartridges, used pipe fittings, and drummed solid waste generated in the laboratory and process plant.

Equipment Clean-up

During the final month of the M aquifer restoration, December 1981, and after the uranium restoration goal had been achieved, decontamination of the elution, precipitation and ion exchange circuits in the plant was initiated. At this point near baseline water quality solutions were being treated in three tanks and through the electrodialysis unit. The ion exchange resin was totally stripped of uranium utilizing a 2.0 normal hydrochloric acid regeneration step and a clean rinse step. The resin was then stored in enclosed lined steel vessels in a clean water salt brine solution to prevent freezing. The acid regeneration plus rinse step was used to dissolve and remove any solids which had been precipitated on or deposited in the ion exchange skid piping, tankage and vessels.

Final Uranium Shipment

The uranium stripped from the three resin beds was precipitated as uranium peroxide slurry and drummed. All contained uranium slurry generated during the restoration operation was shipped to a licensed facility December 27, 1981.

Plant & Equipment Decontamination for Storage

Following the resin clean-up and product precipitation, a 3,000 gallon batch of one normal HCl was prepared in the elution skid tankage and was transferred between the elution make-up, low preg, precipitation, backwash holding and sodium carbonate make-up tanks to dissolve and remove any uranium or any other potential radiologically dangerous

solids present ($CaCO_3$, Fe_2O_3, etc.). This solution was also used to remove contaminants in the sump trough and sump and was then transferred to the brine holding tanks for disposal. The tanks were then rinsed thoroughly with potable water and were totally drained and have subsequently been sealed. M Zone restoration was completed December 20, 1981 and the following month was consumed in decontamination activities. All PVC piping, aluminum, electrical conduit, filters, vents and associated equipment that was not an integral part of one of the two skid-mounted plant units were dismantled and transferred to the licensed waste facility. The electrodialysis piping and stack were flushed for several hours with 10% HCl potable water solutions and then flushed for several hours with a clean water rinse. The piping unit was drained and the stack was drained and refilled with a 50% polyethylene glycol-potable water solution to prevent membrane freezing. The membrane stack was then sealed in 10 mil plastic to prevent solution evaporation and membrane drying. The four tanks which had been in use on the restoration circuit were drained and flushed with clean water and then sealed. The steel sand filters were backwashed, drained and sealed. All tank lids and surfaces, pumps and remaining plant equipment were scrubbed and washed with potable water. When necessary, dilute hydrochloric acid solutions were used to remove calcite scale or other solids adhering to these units. The plant floor was washed with a dilute hydrochloric acid solution and then rinsed with copious volumes of potable water. The sump trough and sump were again acid washed and rinsed and residual solids were drummed and hauled to the waste facility (one partial drum of mud). Unused process

chemicals were sold or removed to the disposal facility (salt, soda ash, CO_2, H_2O_2, HCl flocculent). All brine and liquid waste generated in the decontamination project were hauled for disposal leaving the outside holding tanks empty at the termination of the project.

Radiological Decontamination Surveys

Radiological decontamination surveys were performed to check the results of decontamination efforts. These surveys consisted of a 27-station surface contamination area survey, air sampling for long half-life radionuclides, beta gamma surveys, and airborne uranium particulate surveys were completed and documented. The results of these surveys are attached. The one area showing residual contamination was a catch vessel under the precipitation tank which showed high surface contamination. This unit was removed to the disposal facility and the area was rewashed with potable water. During the decommissioning period, personnel were terminated on a schedule coinciding with process and associated personnel requirements. Final bioassay samples and TLD badges were analyzed at the point of termination and the final TLD bioassay samples in addition to the plant area TLD badges were submitted for analysis in January 1982.

Wellfield Clean-up

In order to allow surface reclamation and remove all potentially contaminated equipment, all surface wellfield piping with the exception of the trunk lines joining the plant and wellfield flow distribution center were removed to the disposal facility. The trunks were left in order to provide flow paths if additional wellfield restoration should be required.

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Resin Transfer

In late February, the ion exchange resin was transferred to lined DOT 17H drums and shipped to a licensed uranium facility. In order to ensure that no contamination occurred during resin transfer, the plant and equipment and floor were washed with potable water and a 59-station removable surface contamination survey was performed. This survey is also attached and was performed March 16, 1982.

At all times during these operations, the plant bay door was open to allow maximum air circulation and the ventilation system was operating.

gates are posted with warning signs stating "Caution. Any area or room within this facility may contain radioactive materials." All gates and doors remain chained and locked at all times when no one is present on the site.

Plant Employee Duties and Qualifications

One full-time Teton employee reamains on the Leuenberger R & D payroll. This individual was designated to perform the M Zone restoration stability sampling, an analysis report on the R & D operation and restoration project, ensure site security and maintain reasonable compliance with the continuing area of radiological monitoring programs. Currently, this individual spends approximately three days per month on site which is required for well sampling and roughly one hour per month exposed to the inside of the plant building for the removal and replacement of the equipment which is stored in the building and used for the sampling program in the wellfield.

The individual assigned to these duties has had eight years of experience in the uranium industry. He has been trained to the technician level on the proper use of radiation sampling equipment needed to identify potential hazards in the process plant building, is well versed in process chemistry, radiation safety procedures and contamination control procedures. He is designated the interim RSO.

PART 2
INTERIM ACTIVITIES AND PROPOSED
RADIATION SAFETY PROGRAM

Introduction

Based upon the results of radiation sampling after plant shut down and decontamination efforts, Teton requests a substantial reduction in the in-plant radiation protection program during the interim between the Research and Development phase and pending commercial activities. Practically speaking, this program is based on plant or building use during the interim period with sufficient flexibility to reduce program requirements based upon radiation activity levels measured.

Plant & Building Use

The proposed use of the plant during the interim period is for storage. The building will be opened approximately three days per month to retrieve and replace sampling equipment to conduct wellfield stabilization sampling outside in the wellfield. Actual time in the building is estimated at approximately one hour per month for one individual. Additional maintenance work on equipment requiring any significant in-plant time is not anticipated. The plant building is being used to house site equipment, including a backhoe, portable generator, portable hi-volume air sampling station, and skid-mounted transfer pump. In addition, the remaining plant equipment includes sealed process tankage, the elution and ion exchange skids, and the electrodialysis unit. All area perimeter gates, pond fence gates, building doors and compound

Qualifications for an Interim RSO

The person responsible for radiation safety during the interim (RSO) will be a person with at least four years experience in the uranium industry who is familiar with the chemistry, radiation safety procedures, contamination control procedures, and a technician's knowledge of the sampling procedures and applicable radiation sampling equipment and its use. If necessary, Teton may hire a qualified outside independent Radiation Safety Consultant to perform required sampling in the absence of qualified in-house personnel, or to audit the sampling program which has been conducted by the interim in-house RSO.

Duties of the Interim RSO

The interim RSO will control all access to the plant property and buildings by keeping the keys and a record of the individuals who enter the plant building. He will be responsible for maintaining a log which shows the time people enter and leave the building. He will direct all activities within the building, take the appropriate radon samples and necessary alpha swipe samples if maintenance activities occur. He will furnish copies of the results of these records to the Teton Safety Officer. He will conduct any required environmental sampling and maintain necessary records.

Procedures for Interim Plant Building Occupancy

At this point, there should be no specific locations inside the plant which should require a restricted area designation; therefore, the request for specific restricted areas for storage and recovery of uranium slurry should be dropped because all material has been removed from the site and no recovery will take place until the plant is re-activated for commercial or future mining activities.

However, access to the plant building will be controlled as if the entire building is considered a restricted area until it can be sufficiently documented that no radiation hazard exists within the building. The following procedures will be followed for personnel entering the plant building during the interim period:

1. The interim RSO will authorize and control all access to the plant building.

2. The interim RSO will maintain a time log showing the date, name, time in and time out for all persons who enter the building during the interim, including himself. This time log will act as an authorization to enter, a record of time spent in the plant and will replace the preceeding work permit program.

3. If it becomes necessary to remain in the plant building, the plant will be ventilated by opening all bay and outside doors.

4. At any time radon sampling in the plant building shows radon buildup of 25% of maximum permissible concentrations, the electric forced air ventilation system will be activated and remain on during occupancy.

5. Any maintenance work within the plant building on process equipment which could conceivably contain residual radioactive material will be preceeded by radon sampling in the plant and followed by an alpha contamination swipe survey of the potentially effected work area after the work is completed. If the swipe survey indicates concentrations above 100 disintegrations per minute the work area will be washed down with clean water and resurveyed.

6. Equipment or material removed from the site or plant building will either be disposed of at a licensed disposal facility or put to use at a licensed facility. There will be no equipment or material which has been potentially contaminated released for unrestricted use unless the procedures for decontamination of facilities and equipment prior to release for unrestricted use or termination of licenses for by-product source of special nuclear material and annex C guidelines dated November, 1976 are followed and a record maintained.

Radiation Sampling During the Interim

The written procedures and instructions which will be used to implement the suggested radiation protection program during the interim period will be the same standard procedures used during the research and development operations as applicable to the interim program. Basic

procedures and action levels are also delineated in the Health Physics Manual submitted to the NRC for commercial operations. Applicable procedures for radon sampling and alpha swipe sampling in this manual will be followed during the interim.

Radon Sampling

Potential buildup for radon gas during the interim period in the closed building is the greatest source of possible radiation contamination, therefore, radon gas samples will be conducted on the process plant floor monthly until such time as it can be determined that radon accumulation is remaining below 25% of the maximum permissible concentration or below .33 working levels. If four consecutive monthly samples show less than the above-mentioned levels, sampling frequency can be reduced to once quarterly.

Radon sampling in the plant building to date has not shown any buildup of radiation. Samples have been taken on the plant floor at numerous locations around the remaining equipment such as the ED stack, remaining tankage, elution and precipitation units after the building has been closed up for a considerable period with no significant radon buildup indicated.

Surface Contamination Surveys

Alpha surface contamination surveys as conducted during the operation should be discontinued in favor of surface surveys to be conducted at any time when equipment is to be worked on or moved around the building.

Sampling Equipment Maintenance & Calibration

Monitoring or sampling equipment needed to maintain a minimum sampling program necessary during the interim period will be calibrated at the manufacturer's suggested interval or annually.

Programs to be Discontinued During the Interim Period

1. The site employee instruction, testing and training program. There are no in-plant employees.

2. Daily walk-through inspection. The requirement for daily documented walk-through inspection of the work area for proper housekeeping practices, implementation of good radiation safety practices and operation of ventilation equipment necessary during operating period should be suspended during the interim period. Plant circuitry has been disconnected and either properly disposed of or sealed as described in the decommissioning activities. Items remaining in the plant have been decontaminated and sealed.

3. Area and personnel TLD programs. Requirements should be terminated during the interim period because of the very limited amount of time anyone will spend in the building and the results of the last surveys.

4. The employee bioassay (urinalysis) program should be discontinued.

5. Airborne particulate sampling should be suspended. Airborne particulate monitoring for uranium during the R & D was not a problem while the plant was in full operation due to the fact that all uranium passing through the plant was in liquid slurry form and all spills were immediately washed down and followed by swipe sampling. As stated above considerable effort was expended to remove all uranium products from the plant; therefore, airborne monitoring should be suspended during the interim period.

Record Keeping Procedures

The interim RSO will keep records of all in-plant radiological sampling and supply copies of the results of these samples and the time log to the Teton Corporate Safety Officer. All records will be kept by the Teton Safety Officer for a period of at least five years unless otherwise specified by regulations.

Interim Audit Program

The Teton Safety Officer will maintain the file of the records in the Teton Corporate office which will include the results of all required radiation surveys and the time log. The Teton Safety Officer will audit these records on a semi-annual basis and check the results of the radiation sampling against the appropriate working level and action level limits.

A memo to the file on a semi-annual basis, confirming a review of the sampling data, a review of the time log and the records maintained by the radiation technician or interim RSO will constitute the interim audit program.

Interim Reporting

A brief quarterly report shall be submitted to the NRC during the interim phase. This report will be in the form of a letter summary that provides the status of the plant and any pertinent activity which has taken place during the previous quarterly period including a copy of the time log showing actual time spent in the plant during the quarter and the results of the available radiation samples conducted.

Interim Environmental Sampling

Solar Evaporation Ponds - During the interim period the leak detection systems in the solar evaporation ponds should be changed from the current requirement of every two weeks to a monthly detection tube check and water level measurements. Also, an annual sample of pond water should be analyzed to note the effects of evaporation on the contents of the North and South Solar Evaporation Ponds.

Interim Environmental Monitoring

The site area air particulate sampling, Rn-222 sampling, air particulate radiological sampling, pond level and detection tube monitoring and restoration stability sampling have been performed to date as outlined in license SUA-1373, Stipulation No. 29.

The following portions of this program should be suspended during the interim period:

Air, and air particulate, environmental dosimetry, and surface water sampling required under the license as presented in

Table 5.2.1.01 of the license should be suspended until such time as the facility is reactivated. At the time, commercial mining activities are contemplated and prior to site activation, this plan should be reinstituted in such a form as to comply with the environmental monitoring program as approved by the commercial license.

Remaining Environmental Obligations

Environmental monitoring obligations which remain under license SUA-1373 include a one-time final soil and vegetation sampling and a radiation background survey of the R & D permit area which would normally be conducted after final surface restoration has been accomplished. These environmental sampling obligations should remain a part of the amended license; however, we request that the taking of the final samples and the final background survey be delayed until after the commercial operation has taken place or a decision has been made to terminate the license and completely restore the surface of the R & D permit area.

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PROCESS & RESTORATION WASTE WATER &
POTENTIALLY CONTAMINATED SOLID WASTE
TRANSPORTED FOR DISPOSAL & BURIAL

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MONTHLY SUMMARY SHEET

WASTE WATER TRANSFERRED FROM TETON LEUENBERGER

PHASE I - June 2 Through July 14, 1981
Solar Evaporation Pond Water
Transportation: 8,400 Gallon Truck

Month	No. of Trips	No. of Gallons	Cumulative Gallons
June	118	991,200	991,200
July	37	310,800	1,302,000

PHASE I Total Pond Water Transported 1,302,000

PHASE II - July 15 Through December 22, 1981
Ground Water Restoration Waste or Brine Water
Transportation: 3,000 Gallon Water Truck

Month	No. of Trips	No. of Gallons	Cumulative Gallons
July	35	105,000	1,407,000
August	60	180,000	1,587,000
September	54	162,000	1,749,000
October	59	177,000	1,926,000
November	66	198,000	2,124,000
December	55	165,000	2,289,000

PHASE II Total Ground Water Restoration Water Transported 987,000

TOTAL WASTE WATER TRANSPORTED 2,289,000

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POTENTIALLY CONTAMINATED SOLID WASTE
TRANSPORTED FOR BURIAL

Unit	Item	Contents	Estimated Volume
30 ea.	55 gal. drums	Cartridge filters Tank sludge Plastic pipe fittings Metal pump parts	8.33 yds.^{3}
45 ea.	Tires	Rubber	7.00 yds.^{3}
600 ft.	PVC pipe	PVC plastic	22.22 yds.^{3}
2 tons	Paper sacks	Soda ash	7.11 yds.^{3}
3 pickup loads	Loose miscellaneous	Aluminum conduit Tin vent & ducting PVC scrap Wood scrap	11.85 yds.^{3}
Total Estimated Solid Waste Volume			56.51 cubic yards

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UNC TETON EXPLORATION DRILLING, INC.

WELL # South Solar Pond Hauled to Disposal

DATE SMPLD	5-14-81						
ANALYSIS DATES	5-15-81 ↓ 7-14-81						
HCO_3^- mg/l	720						
$CO_3^=$ mg/l	-0-						
Cl^- mg/l	1790						
$SO_4^=$ mg/l	940						
Anion eq.	81.85						
Ca^{++} mg/l	180						
Mg^{++} mg/l	117						
Na^+ mg/l	1422						
K^+ mg/l	24						
Cation eq.	81.07						
-/+balance	100.96						
Sum TDS	5193						
Cond um/cm	6250						
TDS mg/l	4948						
pH unit							
U mg/l	13						
Alk mg/l	590						
Al mg/l							
NH_3 mg/l							
As mg/l	0.145						
Ba mg/l							
B mg/l							
Cd mg/l							
Cr mg/l							
Cu mg/l							
F mg/l							
Fe mg/l	0.05						
Pb mg/l							
Mn mg/l							
Hg mg/l							
Mo mg/l							
Ni mg/l							
NO_2/NO_3 "							
Se mg/l	0.112						
V mg/l							
Zn mg/l							
Ra^{226} pci/l	1144 ± 17						
Th^{230} pci/l	15.1 ± 2.1						
POLONIUM 210	6 ± 2						
LEAD 210 "	4 ± 2						

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UNC TETON EXPLORATION DRILLING, INC.

WELL # EDR Brine-Bleed Hauled to Disposal

DATE SMPLD	7-23-81	8-3-81	9-1-81	11-2-81	12-15-81		MEAN
ANALYSIS DATES	7-24-81 ↓ 8-25-81	8-4-81 ↓ 9-5-81	9-2-81 ↓ 10-5-81	11-3-81 ↓ 12-29-81	12-16-81 ↓ 1-25-81		7-81 ↓ 12-81
HCO_3^- mg/l	2616	2255	2418	2202	1732		2245
$CO_3^=$ mg/l	-0-	-0-	-0-	-0-	-0-		-0-
Cl mg/l	157	139	158	110	72.4		127
$SO_4^=$ mg/l	1020	804	1108	870	668		894
Anion eq.							
Ca^{++} mg/l	453	310	222	271	180		287
Mg^{++} mg/l	156	119	143	119	82		124
Na^+ mg/l	641	681	676	591	451		608
K^+ mg/l	60	74	64	60	48		61
Cation eq.							
-/+balance							
Sum TDS	5147	4382	4789	4223	3235		4355
Cond um/cm	3871	4543	5072	4326	3343		4231
TDS mg/l	2902	3216	5391	2964	2587		3412
pH unit	6.5	6.5	6.4	6.7	6.90		6.6
U mg/l	<0.10	<0.10	<0.10	<0.001	2.80		0.56
Al mg/l	* <0.05				* <0.05		
NH_4^- mg/l	* <0.10				* <0.10		
As mg/l	0.043	0.055	0.057	0.040	0.18		0.075
Ba mg/l	NA				NA		
B mg/l	NA				NA		
Cd mg/l	* <0.01				* <0.01		
Cr mg/l	* <0.05				* <0.05		
Cu mg/l	* <0.05				* <0.05		
F mg/l	* 0.97				* 0.81		
Fe mg/l	NA				NA		
Pb mg/l	* <0.05				* <0.05		
Mn mg/l	* <0.05				* <0.05		
Hg mg/l	* <0.001				* <0.001		
Mo mg/l	* <0.10				* <0.10		
Ni mg/l	* <0.05				* <0.05		
NO_2/NO_3 "	<1.0				2.35		
Se mg/l	0.011	0.017	0.020	0.028	0.71		0.116
V mg/l	* <0.10				* <0.10		
Zn mg/l	* <0.01				* <0.01		
Ra^{226} pci/l	6242 ± 43	2323 ± 25	4275 ± 32	575 ± 11	3024 ± 31		3288
Th^{230} pci/l	NA	NA	NA	NA	NA		
Gross A "	6356 ± 58	1956 ± 31	4684 ± 233	618 ± 25	NA		3404
Gross B "	2254 ± 22	2044 ± 23	928 ± 67	1170 ± 44	NA		1599

* CALCULATED FROM EDR PERFORMANCE DATA

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AIR SAMPLING
LONG HALF LIFE RADIONUCLIDES

December 11, 1981

OFFICIAL DOCKET COPY

(UNC) **UNC TETON EXPLORATION DRILLING, INC.**

RADIATION FORM 18

0400872809

RADIOLOGICAL SURVEY - URANIUM MINE SITES
AIR SAMPLING - LONG HALF LIFE RADIONUCLIDES

LOCATION: *Läuenberger*
DATE: *12/11/81*
SURVEYOR: *[signature]*

SAMPLE LOCATION	COLLECTION *12/11/81* TIME From	TIME To	Total Time Minutes	FLOW RATE CFM LPM Initial	FLOW RATE Final	Total volume in ML	ANALYSIS *12/3/81* COUNT TIME From	COUNT TIME To	TTL. CNT. Time Minutes	Gross Counts	CPM	BKG	Corrected Counts CPM-BKG	Activity µCi/ml
1. *waist level - Process Area - by Ex. Slcid*	*2230*	*2330*	*60*	*60lpm*	*60lpm*	*3.6x10^6*	*1330*	*1420*	*50*	*799*	*15.98*	*2.1*	*13.88*	*3.77x10^-*
2.														
3.														
4.														
5.														
6.														

MPC = 1x10^-10 µCi/ml

☒ ROUTINE ☐ SPECIAL (If special, indicate reason for initiation of survey below) ☐ CORRECTIVE ACTION TAKEN

Elution/precipitation going on during sample period. Sampled w/ Ras-1 pump onto Gelman Type A filter. Counted on SAC-R5/PRS-1

50 minute Bkg. Count of clean filter = 105 counts = 2.10 cpm

Doors closed but wall + stack vent systems operating.

INITIAL FLOW + FINAL FLOW ÷ 2 = AVERAGE FLOW

AVERAGE FLOW X TOTAL TIME = TOTAL VOLUME

VOLUME $ft^3 \times 2.83 \times 10^4$ VOLUME IN ml

VOLUME $L \times 10^3$ = VOLUME IN ml

$\frac{(CPM-BKG)(4.5 \times 10^{-7}\ \mu Ci/dpm)}{(\alpha EFF)(VOLUME\ IN\ ml)} = \mu Ci/ml$ 2" FILTER & 4" FILTER

$\frac{(CPM-BKG)(4.5 \times 10^{7}\ Ci/dpm)(4)}{(\alpha EFF)(VOLUME\ IN\ ml)} = \mu Ci/ml$ 4 CUT TO 2"

SAMPLE PUMP ID. No. ______ Cal. DATE ______ Cal. Cor. ______

1. AIR SAMPLE COLLECTION MINIMUM OF 3000 LITRES OR 106 Cu. Ft.
2. SAMPLE COUNT & BKG COUNT MINIMUM OF 50 MINUTES
3. ANALYSIS MINIMUM OF 24 HOURS AFTER COLLECTION
4. CALLIBRATION CHECK
   THORIUM 230 STANDARD ID. No. *11123*
   1 Min. COUNT DPM *15310*
   GROSS COUNTS (CPM) *7043*

$\frac{CPM}{DPM}$ X 100 = % EFF EFFICIENCY = *46.00* %

20605

TETON - R3

UNC TETON EXPLORATION DRILLING, INC.

RADIATION FORM 18

8209080078 04

RADIOLOGICAL SURVEY - URANIUM MINE SITES

AIR SAMPLING - LONG HALF LIFE RADIONUCLIDES

LOCATION: [illegible]

DATE: 1/20/82

SURVEYOR: [illegible]

SAMPLE LOCATION	COLLECTION: TIME From	To	Total Time Minutes	FLOW RATE CFM LPM Initial	Final	Total Volume in ML	ANALYSIS: COUNT TIME From	To	TTL. CNT. Time Minutes	Gross Counts	CPM	BKG	Corrected Counts CPM-BKG	Activity µCi/ml
1. Central Plant [illegible]	0923	1023	60	[illegible]	[illegible]	.6x10	[illegible] 9:29	[illegible] 10:19	50	331	6.62	1.6	5.02	1.4x10
2.														
3.														
4.														
5.														
6.														

☐ ROUTINE ☐ SPECIAL (If special, indicate reason for initiation of survey below) ☐ CORRECTIVE ACTION TAKEN

[illegible] = 1.4 [illegible] = 1.6 [illegible] 8:36 - 8:26 12:29 - 12:53

9:29 - 10:19

INITIAL FLOW + FINAL FLOW ÷ 2 = AVERAGE FLOW

AVERAGE FLOW X TOTAL TIME = TOTAL VOLUME

VOLUME ft^3 X 2.83×10^4 VOLUME IN ml

VOLUME L X 10^3 = VOLUME IN ml

$\frac{(CPM - BKG)(4.5 \times 10^{-7}\ \mu Ci/dpm)}{(\alpha EFF)(VOLUME\ IN\ ml)} = \mu Ci/ml$ 2" FILTER & 4" FILTER

$\frac{(CPM - BKG)(4.5 \times 10^{7}\ Ci/dpm)(4)}{(\alpha EFF)(VOLUME\ IN\ ml)} = \mu Ci/ml$ 4 CUT TO 2"

SAMPLE PUMP ID. No. ________ Cal. DATE ________ Cal. Cor. ________

1. AIR SAMPLE COLLECTION MINIMUM OF 3000 LITRES OR 106 Cu. Ft.
2. SAMPLE COUNT & BKG COUNT MINIMUM OF 50 MINUTES
3. ANALYSIS MINIMUM OF 24 HOURS AFTER COLLECTION
4. CALLIBRATION CHECK
   THORIUM 230 STANDARD ID. No. 11123
   1 Min. COUNT DPM [illegible]
   GROSS COUNTS (CPM) [illegible]

$\frac{CPM}{DPM}$ X 100 = % EFF EFFICIENCY = [illegible] %

TETON - R3

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0400872809OE

GROSS ALPHA SURVEY

December 21, 1981

GROSS ALPHA SURVEY P 1 of 3 12/21/.

04008728090E

PRS-1 | AC-3-8

COUNT TIME: 0.5 MINUTE

SURVEYOR: RK Hilbert

LOCATION	READING (cpm)		LOCATION	READING (cpm)
	① 21		GRATING @	① 5
① FLR @ APT TANK	② 12		(20) CHEM. M.U. TNK	② 4
	① 8		GRATING IN	① 3
② SUMP	② 7		(21) FRT OF IX CLS	② 1
	① 0		FLR IN FRT OF	① 4
③ REC SUMP	② 3		(22) IX SKID	② 8
	① 14		SOUTH PLANT	① 2
④ Inj. Snubr Stn	② 16		(23) WALK DOOR	② 0
FLR BTWN LO PRES	① 5		FLOOR @	① 5
⑤ & EL. M.U. TNKS	② 5		(24) B16 DOOR	② 5
WOOD CONTAINMENT	① 191	Removed during decommissioning	NORTH PLANT	① 7
⑥ @ APT TNK	② 83		(25) WALK DOOR	② 0
	① 4		INSIDE LAB	① 0
⑦ TOP OF LO PRES TNK	② 4		(26) DOOR	② 2
TOP OF EL.	① 7			①
⑧ M.U. TNK.	② 5		(27) ~~OUTSIDE LAB DOOR~~	②
	① 15		EAST LAB	① 1
⑨ TOP OF APT. TNK	② 11		(28) COUNTER	② 0
FLR BTWN REC.	① 12		EAST SIDE	① 0
⑩ & ED FD. TNK	② 10		(29) ISLAND COUNTER	② 1
FLR BTWN ED FD	① 6		WEST SIDE	① 1
⑪ & M-INJ. TNK	② 12		(30) ISLAND COUNTER	② 0
WOOD PLATFORM	① 10		DESK TOP	① 0
⑫ BEHIND IX SKID	② 13		(31) IN LAB	② 0
	① 17		FLR OF	① 6
⑬ FLR BEHIND NACO3 TNK	② 3		(32) LADIES R.R.	② 5
TOP OF	① 8		EAST DOOR	① 1
⑭ WORK BENCH	② 3		(33) LADIES R.R.	② 2
FLR BEHIND	① 4-4		WEST DOOR	① 0
⑮ ED UNIT	② 35		(34) LADIES R.R.	② 0
FLR IN FRT OF	① 25		WEST DOOR	① 1
⑯ ED UNIT	② 26		(35) MENS R.R.	② 1
	① 3		FLOOR OF	① 1
⑰ OPERATORS BENCH	② 11		(36) MENS R.R.	② 2
TOP OF	① 51		EAST DOOR	① 1
⑱ CHEM M.U. TNK	② 45		(37) OF MENS RR	② 1
TOP OF TAILS	① 2		PLANT OFFICE	① 4
⑲ BLEED TNK	② 9		(38) DOOR	② 0

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	FLOOR OF	① 3			
39	MAIN OFFICE AREA	② 1			
	FLOOR OF	① 1			
40	MGR'S OFFICE	② 1			
	LUNCHROOM	① 1			
41	FLOOR	② 1			
		① 0			
42	OUTSIDE DOOR	② 0			
	W.F. TLR	① 1			
43	FLOOR	② 4			
	W.F. TLR	① 3			
44	WORK BENCH	② 1			
45					

04008728090E

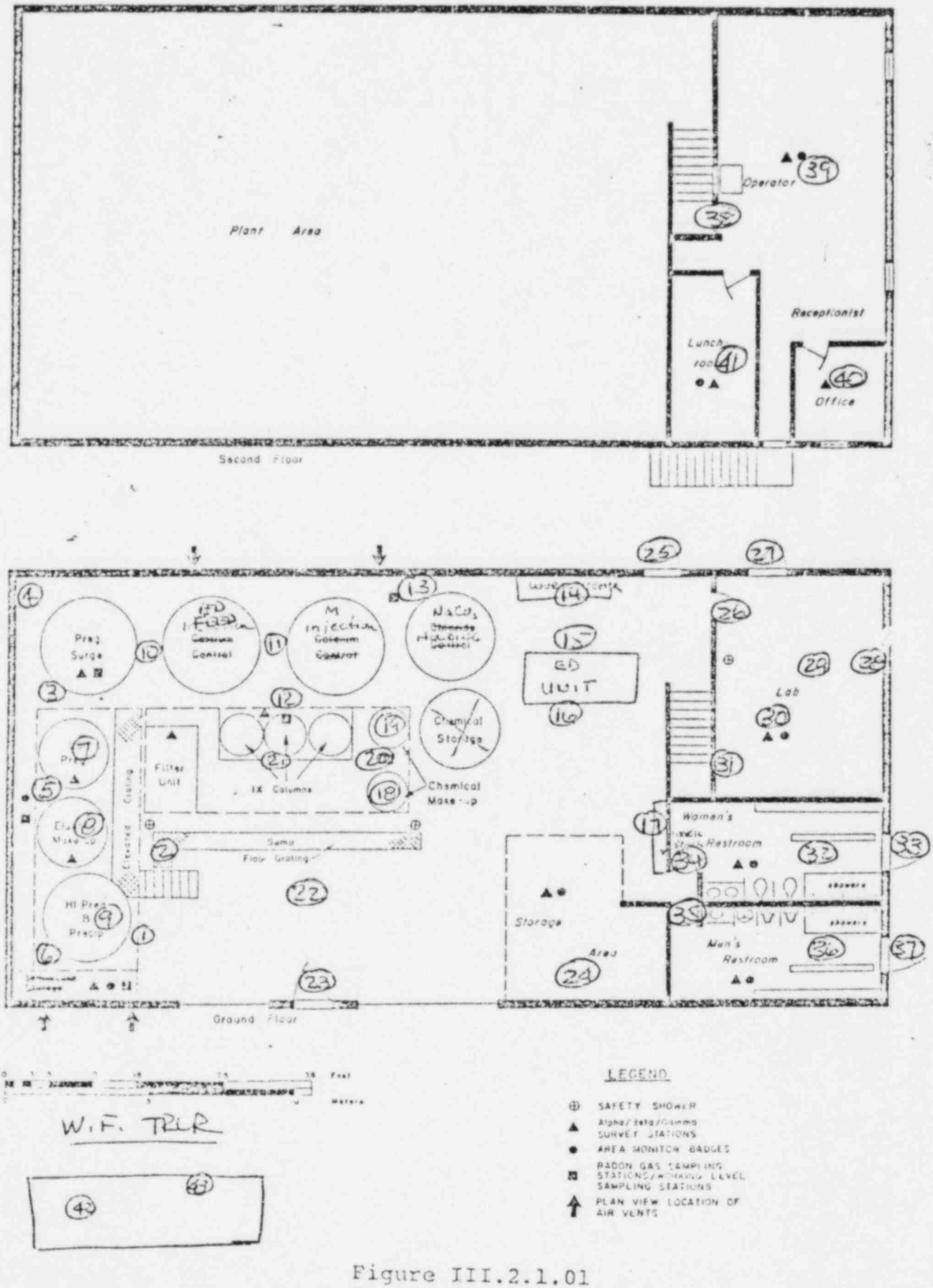

Figure III.2.1.01
Process Plant Layout

BETA GAMMA SURVEY

December 28, 1981

Plant Decontamination Survey 12/28/81

04008728 09PE

Total Gamma Survey

Beta

Bkg = 0.020 mRem/hr.

Raw Reg Tank	.113, .133, .095, .143 } = 0.121 mRem/hr inside Tank	outside Tank + 0.5' .209, .120, .203, .149 } = 0.170	0.146 − .020	= 0.126
EL. M.U. Tank	.191, .168, .062, .183 } = .151 mRem/hr inside Tank	Tank wall + 0.5' .104, .121, .173, .093 } = 0.123	0.137 − .020	= 0.117
PDT. Tank	.309, .369, .481, .303 } = 0.366 mRem/hr inside Tank	Tank wall + 0.5' .043, .069, .063, .036 } = 0.053	0.210 − .020	= 0.190
Rec. Tank	.088, .188, .126, .114 } = 0.129 mRem/hr inside Tank	Tank wall + 0.5' .112, .127, .164, .129 } = 0.133	0.131 − .020	= 0.111
ED Feed Tank	.074, .082, .053, .051 } inside Tank = 0.066 mRem/hr.	Tank wall + 0.5' .082, .076, .107, .103 } = 0.092	0.079 − .020	= 0.059
M-Inj. Tank	.1076, .1068, .1069, .096 } inside Tank = 0.077 mRem/hr.	Tank wall + 0.5' .147, .102, .054, .103 } = 0.102	0.090 − .020	= 0.070
Tanks B/W Tank	.088, .081, .244, .044 .133, .236, .251, .259 } inside = 0.230 mRem/hr	Tank wall + 0.5' .088, .190, .052, .076 } = 0.086	0.158 − .020	= 0.138
Chem M.U. Tank	.047, .059, .042, .041 } inside = 0.046 mRem/hr.	Tank wall + 0.5' .052, .037, .054, .054 } = 0.049	0.048 − .020	= 0.028
N_2H_4 Hold Tank	.109, .099, .083, .053 } inside 0.086 mRem/L	Tank wall + 0.5' .139, .157, .218, .074 } = 0.147	0.116 − .020	= 0.096
ED Stack + 1 foot	.328, .253, .493, .310 } outside = 0.348 − .020 mRem/hr.			= 0.328
IX-C + 0.5 ft.	.116, .122, .121, .061 } outside = 0.105 mRem/L			= 0.085
IX-B + 0.5 ft.	.095, .085, .157, .155 } outside = 0.124 mRem/hr			= 0.104
IX-A + 0.5 ft	.136, .125, .056, .131 } outside = 0.120 mRem/hr.			= 0.100

Avg. for entire plant = 0.~~127~~ 119 mRem/hr.

Assuming no ventilation the plant could build up to ~~5.100~~ 4.775 mRem in a 40 hour period (Action level = 100 mRem/40 hr period

~~as it stands today~~

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AREA TLD REPORTS

January 20, 1982

eberline

EBERLINE INSTRUMENT CORPORATION
P.O. BOX 2108, SANTA FE, NEW MEXICO 87501
PHONE: (505) 471-3232 TWX: 910-985-0678

TLD AREA MONITOR REPORT

DATE ISSUED 01/01/82 DATE ANNEALED 12/15/81 CUSTOMER NO. 4559
DATE RETURNED 01/18/82 DATE READ 01/20/82 PAGE 1 OF 1

BADGE NUMBER	IDENTIFICATION	DOSIMETER READINGS (net mrem)					AVERAGE ±	2σ	MREM/WEEK **	FR
		FIRST	SECOND	THIRD	FOURTH	FIFTH				
1000	CONTROL	11	10	9	9	9	9.7	1.4	1.89	
1001		10	8	9	9	8	9.1	1.3	1.77	
1002		9	9	8	9	9	9.1	0.7	1.77	
1003		8	8	9	8	9	8.6	1.3	1.67	
1004		9	7	8	8	8	8.0	1.8	1.56	
1005		8	8	8	9	9	8.6	1.3	1.67	
1006		8	8	8	8	9	8.3	1.3	1.61	
1007		8	8	9	8	8	8.3	1.3	1.61	
1008		11	10	8	9	8	9.2	2.4	1.79	
1009		8	8	9	8	12	9.4	3.3	1.83	

0400 8726 0903

** DOSIMETER DAMAGED

*** BASED ON ELAPSED TIME FROM DATE ANNEALED TO DATE READ

FREQUENCY CODES
M - MONTHLY
Q - QUARTERLY
S - SEMI-ANNUAL
A - ANNUAL
I - IRREGULAR

SIGNED (Thomas) Robertson DATE 01/25/82

CUSTOMER TETON EXPLORATION DRILL
ATTENTION PAUL HILDENBRAND
ADDRESS PO DRAWER A-1
CITY CASPER WY 82602

26605

eberline
EBERLINE INSTRUMENT CORPORATION
P.O. BOX 2108, SANTA FE, NEW MEXICO 87501
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TLD AREA MONITOR REPORT

DATE ISSUED 10/01/81 DATE ANNEALED 09/24/81 CUSTOMER NO. 4559
DATE RETURNED 01/18/82 DATE READ 01/20/82 PAGE 1 OF 1

BADGE NUMBER	IDENTIFICATION	DOSIMETER READINGS (net mrem)					AVERAGE ± 2σ		MREM/WEEK **	FREQ
		FIRST	SECOND	THIRD	FOURTH	FIFTH				
1000	CONTROL	23	32	23	25	24	25.4	7.8	1.51	
1001		165	162	148	181	163	163.8	23.5	9.72	
1002		105	108	105	105	95	103.8	9.7	6.16	
1003		48	42	43	42	33	41.7	10.6	2.47	
1004		38	30	37	38	39	36.3	7.2	2.15	
1005		43	45	27	42	35	38.3	14.5	2.27	
1006		31	53	45	45	47	44.2	16.4	2.62	
1007		32	34	30	32	35	32.5	3.7	1.93	
1008		35	39	27	29	38	33.7	11.0	2.00	
1009		32	37	42	31	35	35.2	8.5	2.09	

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04008728090 5

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SIGNED Theresa Ortega DATE 01/25/82

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ATTENTION PAUL HILDENBRAND
ADDRESS PO DRAWER A-1
CITY CASPER WY 82602

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TLD AREA MONITOR REPORT

DATE ISSUED 07/01/81 DATE ANNEALED 06/24/81 CUSTOMER NO. 4559
DATE RETURNED 10/05/81 DATE READ 10/08/81 PAGE 1 OF 1

BADGE NUMBER	IDENTIFICATION	DOSIMETER READINGS (net mrem)					AVERAGE ± 2σ		MREM/WEEK **	FREQ
		FIRST	SECOND	THIRD	FOURTH	FIFTH				
1000	CONTROL	22	20	21	21	19	20.6	2.3	1.36	Q
1001		92	95	81	102	108	95.4	20.9	6.30	
1002		84	63	62	61	81	70.2	22.4	4.64	
1003		35	25	36	37	35	33.7	9.4	2.23	
1004		26	28	34	26	26	28.0	6.7	1.85	
1005		26	31	28	32	25	28.3	5.9	1.87	
1006		33	36	32	33	40	34.9	6.4	2.31	
1007		25	31	28	28	25	27.2	4.8	1.80	
1008		23	24	28	22	29	25.4	6.4	1.68	
1009		30	34	28	30	37	31.8	6.9	2.10	

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0400878 0903

** DOSIMETER DAMAGED

*** BASED ON ELAPSED TIME FROM DATE ANNEALED TO DATE READ

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A - ANNUAL
I - IRREGULAR

SIGNED [signature]

DATE 10/12/81

CUSTOMER TETON EXPLORATION DRILL
ATTENTION PAUL HILDENBRAND
ADDRESS PO DRAWER A-1
CITY CASPER WY 82602

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TLD AREA MONITOR REPORT

DATE ISSUED 04/01/81 DATE ANNEALED 03/17/81 CUSTOMER NO. 4559
DATE RETURNED 07/17/81 DATE READ 07/21/81 PAGE 1 OF 1

6.06 highest reading .036 mr/hr
168 hrs in week. 168/6.06 should not e

BADGE NUMBER	IDENTIFICATION	DOSIMETER READINGS (net mrem) FIRST	SECOND	THIRD	FOURTH	FIFTH	AVERAGE ± 2σ	MREM/WEEK **	FREQ
1000	CONTROL	31	29	27	25	33	29.1 6.1	1.62	
1001	Eluant Makup tank	155	124	100	74	92	109.1 63.0	6.06	
1002	Yellow cake storage	94	116	116	82	113	104.3 30.8	5.79	
1003	Storage Area	42	42	42	41	44	41.8 2.3	2.32	
1004	Mens Room	46	45	46	42	36	43.2 8.5	2.40	
1005	Womens Room	35	35	37	48	39	38.9 11.2	2.16	
1006	Lab.	39	44	51	46	40	44.0 9.4	2.44	
1007	Lunch Room	31	32	38	39	39	35.8 8.0	1.99	
1008	Main Office	31	33	35	28	34	32.2 5.0	1.79	
1009	Well field Pumphouse	41	45	42	39	38	40.9 4.8	2.27	

P90 08728 903

** DOSIMETER DAMAGED
*** BASED ON ELAPSED TIME FROM DATE ANNEALED TO DATE READ

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SIGNED [signature] DATE 07/27/81

CUSTOMER TETON EXPLORATION DRILL
ATTENTION PAUL HILDENBRAND
ADDRESS PO DRAWER A-1
CITY CASPER WY 82602

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EBERLINE INSTRUMENT CORPORATION
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PHONE: (505) 471-3232 TWX: 910-985-0678

TLD AREA MONITOR REPORT

DATE ISSUED 01/01/81 DATE ANNEALED 12/16/80 CUSTOMER NO. 4559
DATE RETURNED 04/13/81 DATE READ 04/15/81 PAGE 1 OF 1

BADGE NUMBER	IDENTIFICATION	DOSIMETER READINGS (net mrem)					AVERAGE ± 2σ		MREM/WEEK **	FREQ
		FIRST	SECOND	THIRD	FOURTH	FIFTH				
1000	CONTROL	35	39	35	43	46	39.8	9.5	2.32	0.013
1001		84	87	98	100	88	91.4	14.1	5.33	0.031
1002		85	104	98	108	125	103.7	29.2	6.05	0.036
1003		45	45	43	51	48	46.3	6.0	2.70	0.016
1004		42	42	48	49	50	46.2	7.9	2.70	0.016
1005		42	54	40	4[illegible]	35	42.8	14.0	2.50	0.014
1006		55	48	48	50	49	50.3	5.8	2.93	0.017
1007		34	32	42	42	38	37.2	9.0	2.17	0.012
1008		41	41	42	36	34	38.6	6.8	2.25	0.013
1009		55	44	45	39	45	45.5	11.2	2.65	0.015

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SIGNED Mavis Duran DATE 04/16/81

CUSTOMER TETON EXPLORATION DRILL
ATTENTION PAUL HILDENBRAND
ADDRESS PO DRAWER A-1
CITY CASPER WY 82602

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0400872804003

SURFACE CONTAMINATION AREA SURVEYS

1/20/82 After Decontamination
3/16/82 After Resin Transfer

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UNC TETON EXPLORATION DRILLING, INC.

RADIATION FORM 1A

RADIOLOGICAL SURVEY – URANIUM MINE SITES

SURFACE CONTAMINATION AREA SURVEY

LOCATION: Leuenberger

DATE: 1/20/82

SURVEYOR: [illegible]

	SAMPLE LOCATION	Total Counts	Count Time	CPM	BKG CPM	CPM -BKG	1/EFF	DPM/100cm²
1	Under PPT TNK	1590	1	1588	2.06	1581.	2.176	3451
2	In Frt of PPT TNK	6	1	6	2.1	3.9		8.6
3	BET Lo PREG / EL. MU. TK	20		20		17.9		39
4	Behind REC. SURGE TNK	8		8		5.9		12.92
5	TOP of PPT TNK	13		13		10.9		23.8
6	TOP of EL. MU. TNK	12		12		9.9		21.6
7	TOP of Lo-PREG. TNK	3		3		0.94		2.04
8	Behind ED FD TNK	8		8		5.94		12.92
9	Behind IX SKID	26		26		23.9		52.1
10	BEHIND M-INJ. TNK	8		8		5.9		12.9

	SAMPLE LOCATION	Total Counts	Count Time	CPM	BKG	CPM -BKG	1/EFF	DPM/100cm²
11	FLR @ ED UNIT	10	1	10	2.06		2.176	17.3
12	FLR @ WORK BENCH	12		12				21.6
13	FLOOR - MAIN AREA	7		7		4.9		10.7
14	FLOOR BY BIG DOOR	4		4		1.9		4.2
15	FLOOR in FRT of IX	6		6				8.6
16	GRATING @ IX	14		14		11.9		26
17	MAIN OFF. AREA	2		2		<BG		—
18	〃 〃 〃	2		2		<BG		—
19	〃 〃 〃	0		0		—		—
20	〃 〃 〃	5		5				6.4

$(CPM-BKG)(\frac{1}{EFF}) = DPM/100cm^2$

Make Sketch of Area or Item on 1A Supplement

☐ ROUTINE ☐ SPECIAL (If special, indicate reason for survey)

☐ CORRECTIVE ACTION TAKEN

20 minute BKG = 133 Counts = 2.06 CPM BKG

(1) - Contaminated Trough Removed to Sxxxxx - 1/22/82

1. SAMPLE AREA $100 cm^2$ WITH 47 mm FILTER PAPER
2. COUNT FOR 1 MINUTE
3. LIMITS: 1000 DPM/$100 cm^2$ $\beta = \gamma$ (BETA-GAMMA)
   1000 DPM/$100 cm^2$ α (ALPHA)
4. CALLIBRATION CHECK
   THORIUM 230 STANDARD ID. No. 11123
   1 Min. COUNT DPM 15,310
   GROSS COUNTS (CPM) 7037

$\frac{CPM}{DPM} \times 100 = \%$ EFF EFFICIENCY = 45.96% $\frac{1}{EFF}$ 2.176

TETON - R1

8204280060

20605

0400 87280 90E

Counts	Time	CPM	Bkg	CPM - Bkg	1/EFF	DPM/100 cm²
(21) Lunch Room 3	1	3	2.06 ↓	.94	2.176 ↓	2.04
(22) MGE Office 2	1	2		<BG		—
(23) LAB 0	1	0		<BG		—
(24) W RR 8	1	8		5.9		12.9
(25) M RR 4	1	4		1.9		4.22
(26) WF RR 6	1	6		3.9		8.6
(27) Warehouse 1	1	1		<BG		—

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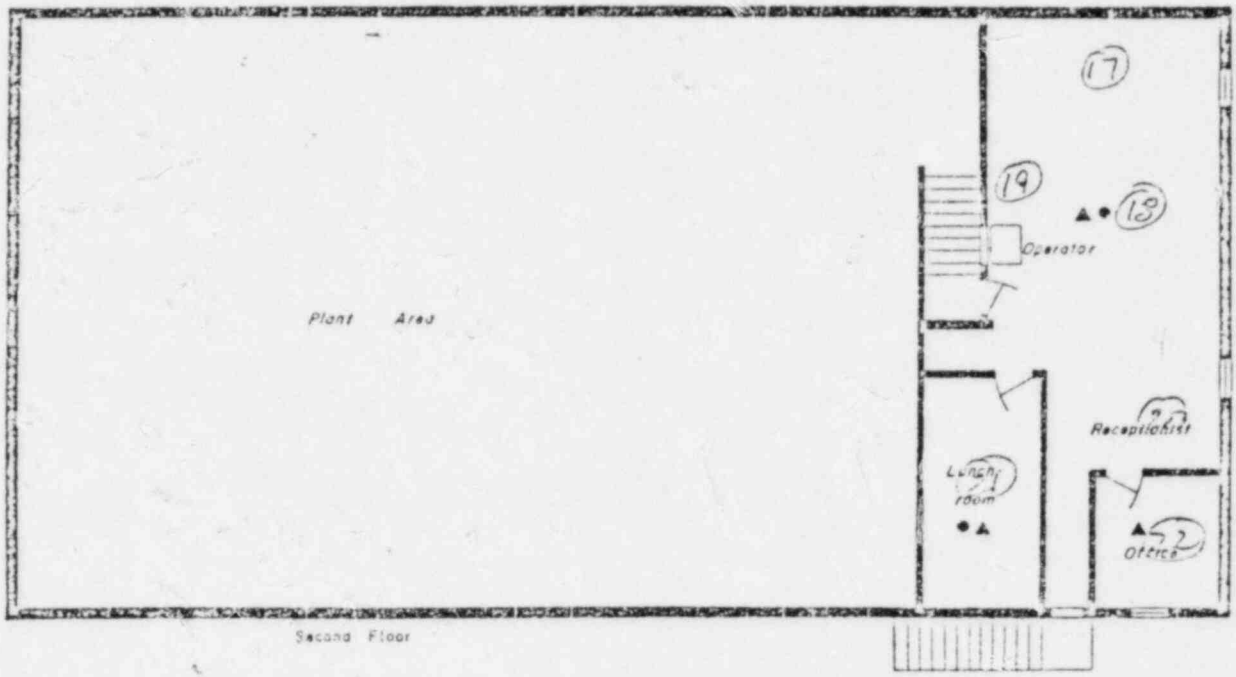

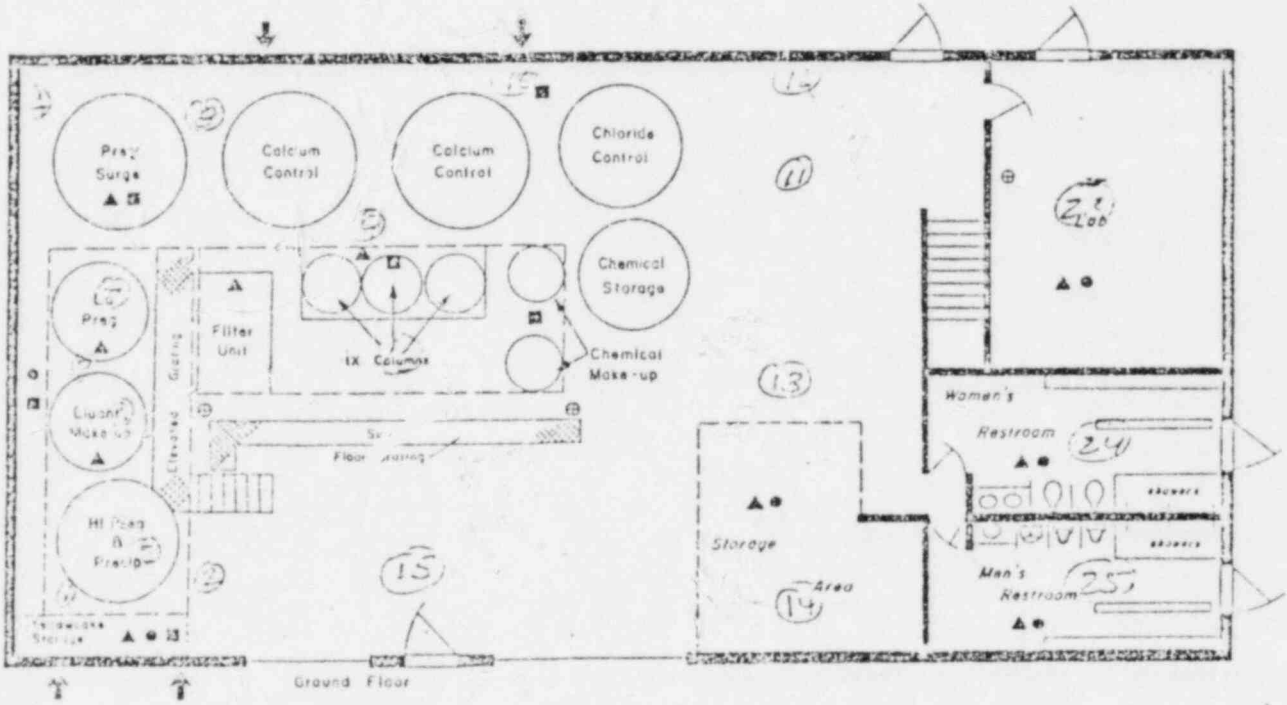

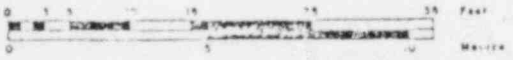

LEGEND

- ⊕ SAFETY SHOWER
- ▲ Alpha/Beta/Gamma SURVEY STATIONS
- ● AREA MONITOR BADGES
- ■ RADON GAS SAMPLING STATIONS/WORKING LEVEL SAMPLING STATIONS
- ▲ PLAN VIEW LOCATION OF AIR VENTS

W.E.T Chlor Floor = #26
Washer #27

Figure III.2.1.01
Process Plant Layout

UNC TETON EXPLORATION DRILLING, INC.

RADIATION FORM 1A

RADIOLOGICAL SURVEY - URANIUM MINE SITES

SURFACE CONTAMINATION AREA SURVEY

LOCATION: Leuenberger Project

DATE: 3-16-82

SURVEYOR: R.A. Garling

SAMPLE LOCATION	Total Counts	Count Time	CPM	BKG	CPM -BKG	1/EFF	DPM/100cm²
1 PPT Tank Skid	39	1	39	2.2	36.8	2.18	80
2 EMT Tank Skid	5	1	5	2.2	2.8	2.18	6.1
3 LPT Tank Skid	5	1	5	2.2	2.8		6.1
4 Sump Area Floor	2	1	2	2.2	<BG		NA
5 NW Plant Floor-Corn.	2	1	2	2.2	<BG		NA
6 SW Plant Corner	28	1	28	2.2	25.8		56
7 NW Plant Floor	14	1	14	2.2	11.8		26
8 PPT Tank Top	23	1	23	2.2	20.8		45
9 EMT Tank Top	12	1	12	2.2	9.8		21
10 LPT Tank Top	6	1	6	2.2	3.8		8.3
11 RT Side	6	1	6	2.2	3.8	2.18	8.3
12 NIT Side	3	1	3	2.2	0.8		1.7
13 MIT Side	2	1	2	2.2	<BG		NA
14 Na_2CO_3 T Side	4	1	4	2.2	1.8		3.9
15 Floor RT-NIT	8	1	8	2.2	5.8		13
16 Floor NIT-MIT	5	1	5	2.2	2.8		6.1
17 Floor MIT-Na_2CO_3 T	9	1	9	2.2	6.8		15
18 Back Floor RT-NIT	8	1	8	2.2	5.8		13
19 " " NIT-MIT	11	1	11	2.2	8.8		19
20 " " NIT - Na_2CO_3 T	2	1	2	2.2	<BG		NA

$(CPM-BKG)(\frac{1}{EFF}) = DPM/100cm^2$

Make Sketch of Area or Item on 1A Supplement

☐ ROUTINE ☒ SPECIAL (If special, indicate reason for survey)

☐ CORRECTIVE ACTION TAKEN

Post Resin Transfer Decontamination Check

1. SAMPLE AREA 100 cm^2 WITH 47mm FILTER PAPER
2. COUNT FOR 1 MINUTE
3. LIMITS: 1000 DPM/100 cm^2 $\beta = \gamma$ (BETA-GAMMA)
   1000 DPM/100 cm^2 α (ALPHA)
4. CALLIBRATION CHECK
   THORIUM 230 STANDARD ID. No. 11123
   1 Min. COUNT DPM 15310
   GROSS COUNTS (CPM) 7017

$\frac{CPM}{DPM} \times 100 = \%$ EFF EFFICIENCY = 45.85% $\frac{1}{EFF}$ ____

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UNC TETON EXPLORATION DRILLING, INC.

RADIATION FORM 1A

RADIOLOGICAL SURVEY - URANIUM MINE SITES

SURFACE CONTAMINATION AREA SURVEY

LOCATION: LEUENBERGER PROJECT

DATE: 3-16-82

SURVEYOR: R.A.G.

SAMPLE LOCATION	Total Counts	Count Time	CPM	BKG	CPM -BKG	1/EFF	DPM/100cm²	SAMPLE LOCATION	Total Counts	Count Time	CPM	BKG	CPM -BKG	1/EFF	DPM/100cm²
21 EDR POWER UNIT	2	1	2	3	<BG	2.23	NA	31 PLANT FLOOR	4	1	4	3	1	2.23	2.2
22 FLOOR by EDR	11	1	11	3	8		18	32 PLANT FLOOR	6	1	6	3	3		6.7
23 SAND FILTER SIDE	2	1	2	3	<BG		NA	33 "	13	1	13	3	10		22
24 1X A SIDE	2	1	2	3	<BG		NA	34 "	4	1	4	3	1		2.2
25 1X B SIDE	10	1	10	3	7		16	35 "	3	1	3	3	0		0
26 1X C SIDE	2	1	2	3	<BG		NA	36 "	9	1	9	3	6		13.4
27 BWT TOP	3	1	3	3	0		0	37 "	8	1	8	3	5		11.2
28 MIX TANK TOP	5	1	5	3	2		4.5	38 LAB FLOOR	3	1	3	3	0		0
29 1X SKID E. END	11	1	11	3	8		18	39 "	5	1	5	3	2		4.5
30 1X SIDE S. CENTER	8	1	8	3	5		11.2	40 LAB HOOD	5	1	5	3	2		4.5

$(CPM-BKG)\left(\frac{1}{EFF}\right) = DPM/100cm^2$

Make Sketch of Area or Item on 1A Supplement

☐ ROUTINE ☐ SPECIAL (If special, indicate reason for survey)

☐ CORRECTIVE ACTION TAKEN

1. SAMPLE AREA 100 cm² WITH 47 mm FILTER PAPER
2. COUNT FOR 1 MINUTE
3. LIMITS: 1000 DPM/100 cm² $\beta = \gamma$ (BETA - GAMMA)
   1000 DPM/100 cm² α (ALPHA)
4. CALLIBRATION CHECK
   THORIUM 230 STANDARD ID. No. 1123 1
   1 Min. COUNT DPM 12310
   GROSS COUNTS (CPM) 6879

$\frac{CPM}{DPM} \times 100 = \%$ EFF EFFICIENCY = 44.93% $\frac{1}{EFF}$ 2.23

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UNC TETON EXPLORATION DRILLING, INC.

RADIATION FORM 1A

RADIOLOGICAL SURVEY - URANIUM MINE SITES

SURFACE CONTAMINATION AREA SURVEY

LOCATION: LEUENBERGER PROJECT

DATE: 2-16-82

SURVEYOR: RAG

SAMPLE LOCATION	Total Counts	Count Time	CPM	BKG	CPM - BKG	$\frac{1}{EFF}$	$\frac{DPM}{100cm^2}$	SAMPLE LOCATION	Total Counts	Count Time	CPM	BKG	CPM - BKG	$\frac{1}{EFF}$	$\frac{DPM}{100cm^2}$
41 LAB COUNTER SINK	12	1	12	3	9	2.23	20	51 office DOOR FLOOR	1	1	1	3	< BG	2.23	NA
42 "	8	1	8	3	5		11	52 NE office FLOOR	3	1	3	3	0		0
43 WOMENS RR FLOOR	3	1	3	3	0		0	53 NW " "	9	1	9	3	6		13
44 " FLOOR	5	1	5	3	2		4.4	54 EC " "	3	1	3	3	0		0
45 MENS RR FLOOR	4	1	4	3	1		2.2	55 WC " "	7	1	7	3	4		8.9
46 " FLOOR	6	1	6	3	3		6.7	56 wf cp desk	35	1	35	3	32		71
47 LUNCH ROOM COUNTER	2	1	2	3	< BG		NA	57 wf SAMPLE POINTS	4	1	4	3	1		2.2
48 " " FLOOR	5	1	5	3	2		4.4	58 wf WORK BENCH	11	1	11	3	8		18
49 MGR Office	3	1	3	3	0		0	59 Storage area floor	5	1	5	3	2		4.5
50 Recep. Area	7	1	7	3	4	↓	8.9	60 & 61 } inside of removed wf pipe	839	1	839	3	836	↓	1864
									488	1	488	3	485		1082

$(CPM - BKG)\left(\frac{1}{EFF}\right) = DPM / 100cm^2$

Make Sketch of Area or Item on 1A Supplement

☐ ROUTINE ☐ SPECIAL (If special, indicate reason for survey)

☒ CORRECTIVE ACTION TAKEN

60 & 61 MATERIAL REMOVED FOR LICENSED DISPOSAL

1. SAMPLE AREA $100cm^2$ WITH 47mm FILTER PAPER
2. COUNT FOR 1 MINUTE
3. LIMITS: 1000 DPM / $100cm^2$ $\beta = \gamma$ (BETA - GAMMA)
   1000 DPM / $100cm^2$ α (ALPHA)
4. CALLIBRATION CHECK
   THORIUM 230 STANDARD ID. No. _____
   1 Min. COUNT DPM _____
   GROSS COUNTS (CPM) _____

$\frac{CPM}{DPM} \times 100 = \%$ EFF EFFICIENCY = ____ % $\frac{1}{EFF}$ ____

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RADIATION FORM 1A SUPPLEMENT

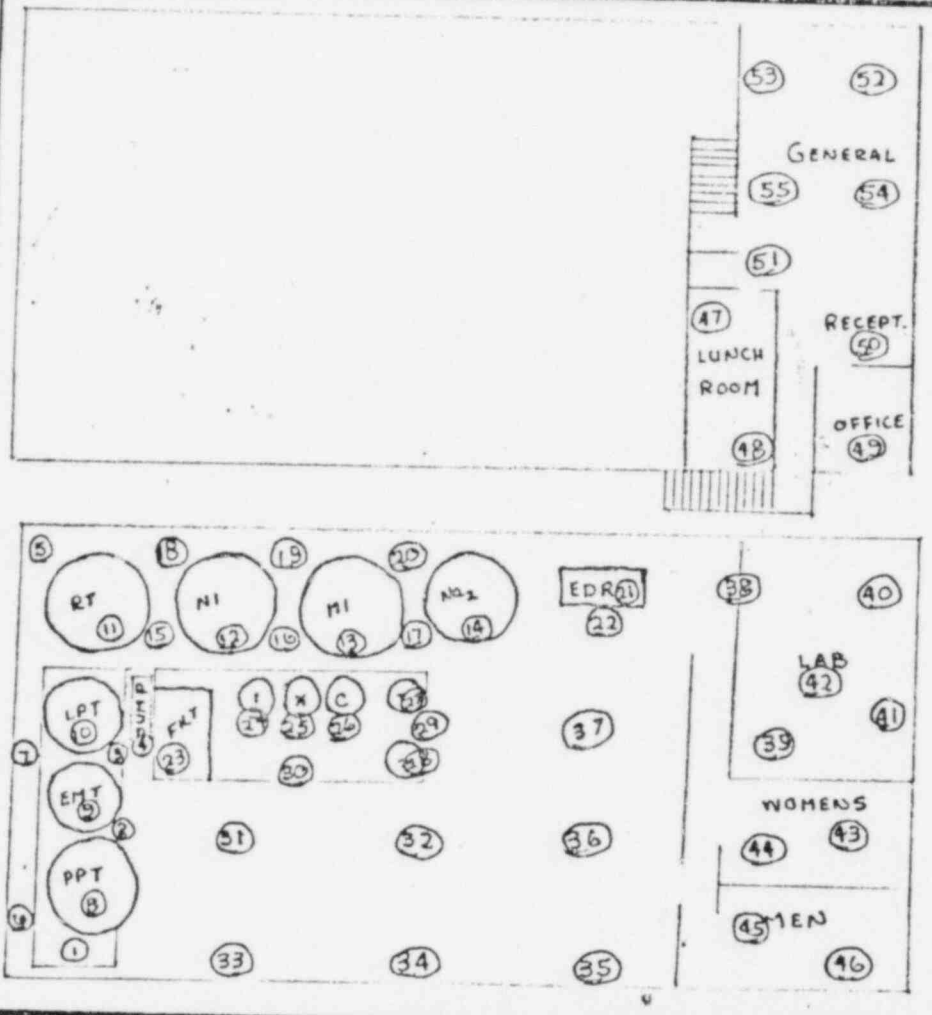
RADIOLOGICAL SURVEY - URANIUM MINE SITES

SURFACE CONTAMINATION AREA SURVEY

LOCATION: Leuenberger Project

DATE: 5-16-82

SURVEYOR: RAG.



WF TRAILER

56 - Op. Desk

57 - Sample Point Floor

58 - Work Bench

59 - Storage Area Floor

Bone Yard

60 - Inside Pipe

61 - Inside Pipe

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1. MAKE SKETCH OF AREA OR ITEM SURVEYED. INDICATE AREA OR LOCATION BY (O) CIRCLE AND NUMBER (①).
2. LIST RESULTS ON FORM 1A AND AT LOCATION ON SKETCH.
3. ATTACH TO FORM 1A.

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URANIUM AIR PARTICULATE

January 28, 1982

0400872809OE

WAMCO LAB

P.O. BOX 3632 • CASPER, WYOMING 82602

ANALYSIS REPORT

COMPANY: TETON EXPLORATION DRILLING, INC. DATE: January 28, 1982

WAMCO NO.	SAMPLE DESCRIPTION			Uranium		u	
3004	Air filter			Ug		uCi/ml	
1	Dated: 1-20-82			.68		1.279 x	10^{-13}

REMARKS:

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RADON DAUGHTER SURVEY 11/12/81

RADON SURVEY 5/20/82

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RADIATION FORM 10

RADIOLOGICAL SURVEY - URANIUM MINE SITES

AIR SAMPLING - RADON GAS

LOCATION: Levenberger Process Bldg.

DATE: 5-20-82

SURVEYOR: R.A. Garling

SAMPLE LOCATION CELL	RESPONSE FACTOR	LOCATION	Time Of Collection	COUNT TIME From	To	TTL. CNT. Time Minutes	Chamber Background CPM	Gross Counts	CPM	Corrected Counts CPM-BKG	Response Factor	Equilibrium Factor	MPC 3×10^{-8} µCi/ml µCi/ml
1. I	3.7×10^9	Beneath EDR Stack	12:30	17:05	17:15	10	0.7	71	7.1	6.4	3.7×10^9	1.0	1.73×10^{-9}
2. 7	4.35×10^9	Behind EDR Feed Tank	12:35	17:16	17:26	10	1.1	52	5.2	4.1	4.35×10^9	1.0	9.43×10^{-10}
3.													
4.													
5.													
6.													

☐ ROUTINE ☒ SPECIAL (If special, indicate reason for initiation of survey below) ☐ CORRECTIVE ACTION TAKEN

Samples Taken To Determine Maximum Possible Rn^{222} Buildup in Closed-Unventilated Plant - Plant Had Been Closed, Locked and Unventilated Since 4-26-82

Samples were drawn at floor level / Cell calibration performed by Core Laboratories

RESPONSE FACTOR = 6.0×10^9 CPM per µCi/ml FOR CS-6

RESPONSE FACTOR = 2.4×10^9 CPM per µCi/ml FOR CS-5

MINUTES BETWEEN TRANSFER & COUNTING	3 to 10	11 to 20	21 to 50	51 to 80	81 to 119	120 to 300
FACTOR OF EQUILIBRIUM	0.5	0.6	0.7	0.8	0.9	1.0

$$\frac{\text{CORRECTED COUNTS (CPM-BKG)}}{\text{(EQUILIBRIUM FACTOR)(RESPONSE FACTOR)}} = \mu Ci/ml$$

1. AIR SAMPLE COLLECTION FOR RADON GAS 1 MINUTE OF FILTERED AIR DRAWN THROUGH CHAMBER CHAMBER VOLUME 0.52 LITERS
2. ANALYSIS 2-5 HOURS AFTER COLLECTION
3. CALLIBRATION CHECK
   THORIUM 230 STANDARD ID. No. 11123
   1 MINUTE COUNT DPM 15310
   GROSS COUNTS (CPM) 6922

$\frac{CPM}{DPM} \times 100 = \%$ EFF EFFICIENCY 45.21 %

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UNC TETON EXPLORATION DRILLING, INC.

Pg 19 4 RADIATION FORM 1C

RADIOLOGICAL SURVEY - URANIUM MINE SITES

AIR SAMPLING - RADON DAUGHTERS

LOCATION: Teton / Green Canyon

DATE: 11/12 - 11/13/81

SURVEYOR: W. R. Farmer

SAMPLE LOCATION	COLLECTION TIME From	TIME To	Total Time Minutes	FLOW RATE LPM Initial	FLOW RATE LPM Final	Total Volume in Liters	ANALYSIS COUNT TIME From	COUNT TIME To	TTL. CNT. Time Minutes	Gross Counts	CPM	BKG CPM	Corrected Counts CPM-BKG	Self ABS Fact	MPC .33 WL WL
1. Water pit S. side	7:14 10	7:19 10	5	2.01	2.01	10.05	1005	1006	1	7	7	0.9	6.1		.0096
2. Under bo Ray Tube	7:20 40	7:25 40	5	2.01	2.01	10.05	1010	1011	1	4	4	0.9	3.1		.0049
3. Behind Rec. Tube	7:27 05	7:32 05	5	2.01	2.01	10.05	1017	1018	1	7.	7	0.9	6.1		.0096
4. Behind Water Tube	7:33 50	7:38 50	5	2.01	2.01	10.05	1023	1024	1	4	4	0.9	3.1		.0049
5. Drop Crate	7:40 30	7:45 30	5	2.01	2.01	10.05	1030	1031	1	3	3	0.9	2.1		.0033
6. Under W Tube	7:00 40	4:05 40	5	2.03	2.03	10.15	451	452	1	8	8	1.2	6.8	140	.0103

☐ ROUTINE ☐ SPECIAL (If special, indicate reason for initiation of survey below) ☐ CORRECTIVE ACTION TAKEN

11/12/81 10 min BKG of Clean Filter = 9 Cnts ÷ 10 = 0.9 CPM

11/13/81 10 min BKG of Clean Filter = 12 Cnts ÷ 10 = 1.2 CPM

All pits & holes underground closed - water to 4 Vent Systems operating

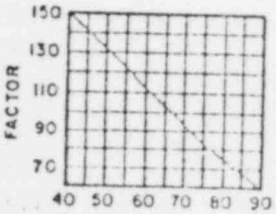
$$\frac{C_2 - C_3}{2C_1 + (C_2 - C_3)} \times 100 = \%\ \text{SELF-ABSORPTION}$$

C_1 = COUNTS FILTER FACE UP

C_2 = COUNTS FILTER BACKSIDE UP

C = COUNTS FILTER FACE UP-COVERED

Factor = 140 / 43.8



$$\frac{\text{CORRECTED COUNTS (CPM-BKG)}}{(\text{EFF})\ (100-\text{SELF ABS.})(\text{FACTOR})(\text{VOLUME LITERS})} = \text{WL}$$

SAMPLE PUMP ID. No. _____ CAL. DATE _____ CAL. COR. _____

1. AIR SAMPLE COLLECTION EXACTLY 5 MINUTES THROUGH 47 mm. FILTER
2. ANALYSIS MINIMUM OF 40 MINUTES AFTER COLLECTION COUNT FOR 1 MINUTE
3. CALLIBRATION CHECK
   THORIUM 230 STANDARD ID. No. 1112 3
   1 MINUTE COUNT
   GROSS COUNTS (CPM) 6886 DPM 15310

$$\frac{\text{CPM}}{\text{DPM}} \times 100 = \%\ \text{EFF}$$ EFFICIENCY 44.98 %

11/13/81 Cal. Check = 7102

Eff = 46.39%

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RADIATION FORM 1C

Pg. 2 of 4

RADIOLOGICAL SURVEY - URANIUM MINE SITES

AIR SAMPLING - RADON DAUGHTERS

LOCATION: Teton / Hauenbeiger

DATE: 11/12 - 11/13 - 81

SURVEYOR: R Hildebrand

SAMPLE LOCATION	COLLECTION						ANALYSIS								
	TIME From	TIME To	Total Time Minutes	FLOW RATE LPM Initial	FLOW RATE LPM Final	Total Volume in Liters	COUNT TIME From	COUNT TIME To	TTL. CNT. Time Minutes	Gross Counts	CPM	BKG CPM	Corrected Counts CPM-BKG	Self Abs. Fact	MPC .33 WL WL
1 (7) [illegible]	4:02	4:07	5	2.01	2.01	10.05	1:53	4:54	1	6	6	1.2	4.8	140	.0073
2 (8) Love	4:13:50	4:18:50	5	2.03	2.03	10.15	5:03	5:04	1	14	14	1.2	12.8	140	.0194
3 (9) Leonis R.R.	4:16	4:21	5	2.01	2.01	10.05	5:06	5:07	1	16	16	1.2	14.8	140	.0227
4 (10) Alexis R.R.	4:20	4:25	5	2.03	2.03	10.15	5:10	5:11	1	8	8	1.2	6.8	140	.0103
5 (11) Mesa Office area	4:22	4:27	5	2.01	2.01	10.05	5:12	5:13	1	27	27	1.2	35.8	140	.0395
6 (12) Mesa Office	4:26	4:31	5	2.03	2.03	10.15	5:16	5:17	1	5	5	1.2	3.8	140	.0058

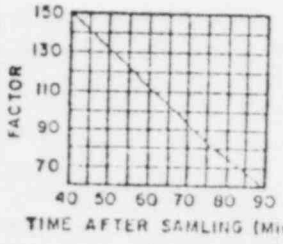
☐ ROUTINE ☐ SPECIAL (If special, indicate reason for initiation of survey below) ☐ CORRECTIVE ACTION TAKEN

$$\frac{C_2 - C_3}{2C_1 + (C_2 - C_3)} \times 100 = \%\ \text{SELF-ABSORPTION}$$

C_1 = COUNTS FILTER FACE UP

C_2 = COUNTS FILTER BACKSIDE UP

C = COUNTS FILTER FACE UP-COVERED



$$\frac{\text{CORRECTED COUNTS (CPM-BKG)}}{(\text{EFF})\ (100-\text{SELF ABS.})(\text{FACTOR})(\text{VOLUME LITERS})} = \text{WL}$$

1. AIR SAMPLE COLLECTION EXACTLY 5 MINUTES THROUGH 47mm. FILTER
2. ANALYSIS MINIMUM OF 40 MINUTES AFTER COLLECTION COUNT FOR 1 MINUTE
3. CALLIBRATION CHECK
   THORIUM 230 STANDARD ID. No. _____
   1 MINUTE COUNT DPM _____
   GROSS COUNTS (CPM) _____

$\frac{\text{CPM}}{\text{DPM}} \times 100 = \%$ EFF EFFICIENCY _____ %

SAMPLE PUMP ID. No. _____ CAL. DATE _____ CAL. COR. _____

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RADIATION FORM 1C

RADIOLOGICAL SURVEY - URANIUM MINE SITES
AIR SAMPLING - RADON DAUGHTERS

PG-3 3 4

LOCATION: Teton / Sweetheart

DATE: 11/12 - 11/13/81

SURVEYOR: P.R. Hodel

SAMPLE LOCATION	COLLECTION						ANALYSIS								
	TIME From	TIME To	Total Time Minutes	FLOW RATE LPM Initial	FLOW RATE LPM Final	Total Volume in Liters	COUNT TIME From	COUNT TIME To	TTL. CNT. Time Minutes	Gross Counts	CPM	BKG CPM	Corrected Counts CPM-BKG	Self Absorption Factor	MPC .33 WL WL
1. (3) Lucknow	4:28	4:33	5	2.01	2.01	10.05	5:18	5:19	1	4	4	1.2	2.8	140	.0043
2. (14) U.F. Tails	3:17 [25]	3:22 [25]	5	2.01	2.01	10.05	4:03 4:11	4:12	1	6	6	1.2	4.8	130.5	.0079
3. (15) Tailings Mill Tails	4:34 [25]	4:39 [25]	5	2.03	2.03	10.15	5:24	5:25	1	7.	7	1.2	5.8	140	.0086
4.															
5.															
6.															

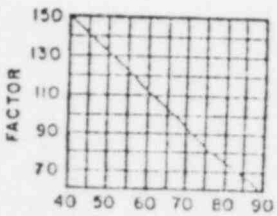
☐ ROUTINE ☐ SPECIAL (If special, indicate reason for initiation of survey below) ☐ CORRECTIVE ACTION TAKEN

$$\frac{C_2 - C_3}{2C_1 + (C_2 - C_3)} \times 100 = \%\ \text{SELF-ABSORPTION}$$

C_1 = COUNTS FILTER FACE UP

C_2 = COUNTS FILTER BACKSIDE UP

C = COUNTS FILTER FACE UP - COVERED



$$\frac{\text{CORRECTED COUNTS (CPM - BKG)}}{(\text{EFF})\ (100 - \text{SELF ABS.})(\text{FACTOR})(\text{VOLUME LITERS})} = \text{WL}$$

1. AIR SAMPLE COLLECTION EXACTLY 5 MINUTES THROUGH 47 mm. FILTER
2. ANALYSIS MINIMUM OF 40 MINUTES AFTER COLLECTION COUNT FOR 1 MINUTE
3. CALLIBRATION CHECK
   THORIUM 230 STANDARD ID. No. _____
   1 MINUTE COUNT DPM _____
   GROSS COUNTS (CPM) _____

$\frac{\text{CPM}}{\text{DPM}} \times 100 = \%$ EFF EFFICIENCY _____ %

SAMPLE PUMP ID. No. _____ - _____ CAL. DATE _____ CAL. COR. _____

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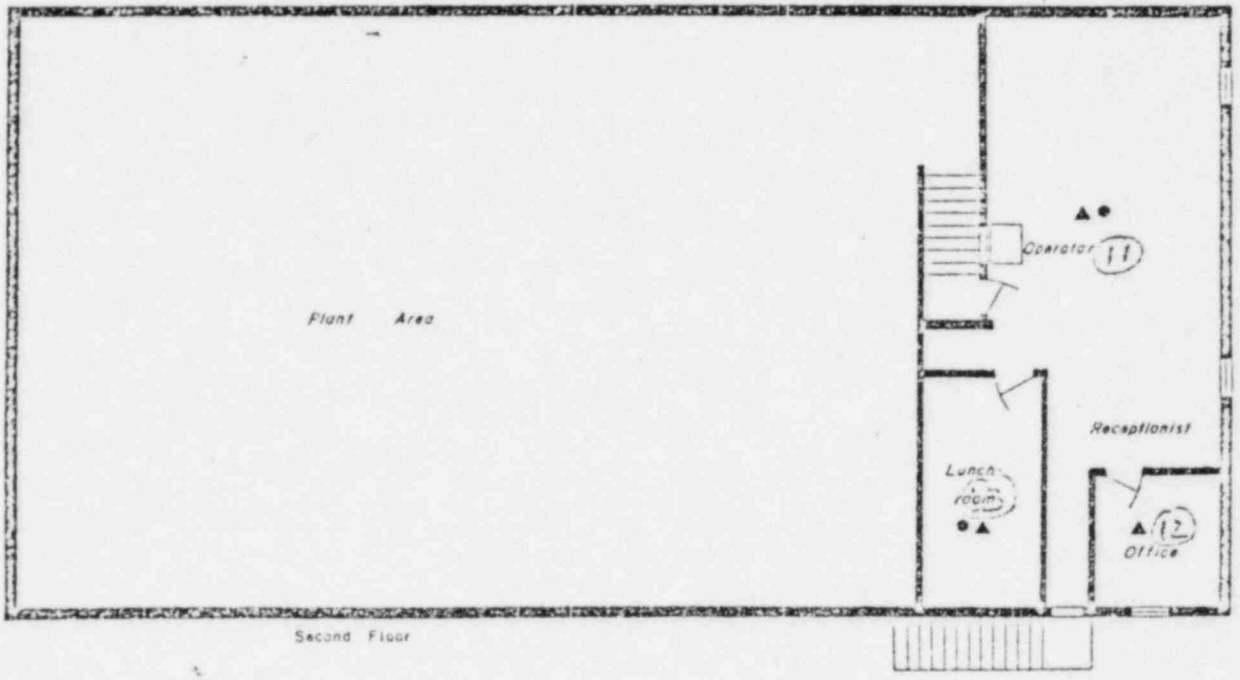
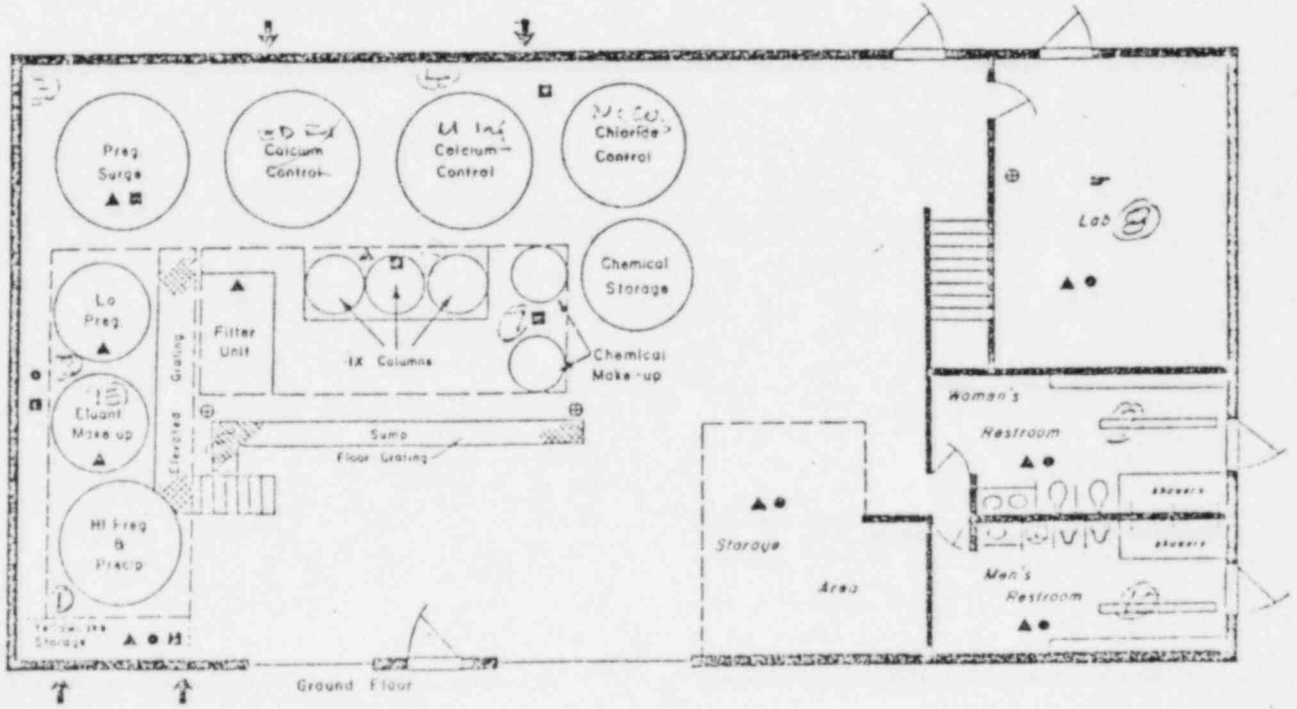
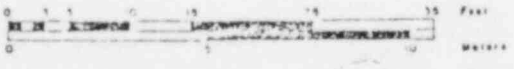
Pg. 4 of 4

Radon Daughter Survey 11/12 - 11/13 / 81







LEGEND

- ⊕ SAFETY SHOWER
- ▲ Alpha/Beta/Gamma SURVEY STATIONS
- ● AREA MONITOR BADGES
- ■ RADON GAS SAMPLING STATIONS/WORKING LEVEL SAMPLING STATIONS
- ⮝ PLAN VIEW LOCATION OF AIR VENTS

W.F. Tell - (14)

Figure III.2.1.01
Process Plant Layout