

FERRET EXPLORATION CO. OF NEBRASKA, INC.

CROW BUTTE PROJECT

Semi Annual ALARA Report
for the Two Quarters Ending
June 30, 1986

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1.0 INTRODUCTION

The initial ALARA audit for the Crow Butte R & D Project covers the time period from January 1, 1986 - June 30, 1986. Site activities primarily included completion of construction of plant facility and office trailer complex. The quality assurance program, standard operating procedures, and radiation safety policies were finalized. U.S. Nuclear Regulatory approval for operations was not received during the audit period.

On June 2,3, 1986, U.S. Nuclear Regulatory Commission inspectors visited the Crow Butte site for a pre-operational inspection. Ten deficient areas were noted by the inspectors; These deficiencies were immediately addressed and corrected. Notice of corrective actions taken to remedy the deficiencies were submitted to the U.S. Nuclear Regulatory Commission (letters dated June 9, 1986 and June 26, 1986).

The following audit report summarizes the ALARA program and activities at the Crow Butte mine site as per Regulatory Guide 8.31. Included are calculations and the summaries of data generated during the first half of 1986. Documentation supporting the data summaries is on file in the HPT/RSO's office at the mine site.

2.0 EXPOSURE RECORDS

Internal and external occupational exposures have been calculated from the data collected during the month of June, 1986. Prior to June, construction activities occurred and Ferret Exploration Co. of Nebraska, Inc. was awaiting approval to commence operation.

Measurements for radon daughters and uranium particulate were performed to identify natural background levels. Area TLD badges have been placed in the plant to provide gamma measurements within the plant and office structure.

Internal exposure calculations were made by utilizing the average concentration of radon daughters measured within the plant and office structure facilities. It was assumed all employees were exposed to this concentration for the month of June for forty hours per week. The maximum individual internal exposure due to radon daughters for the first half of 1986 was 0.0028 WLM.

Occupational internal exposure due to uranium intake was calculated for the month of June to be 1.56×10^{-5} uCi. This is the maximum individual occupational exposure from uranium particulates for the first half of 1986.

Internal exposure due to the combination of radionuclide constituents, radon daughters and uranium particulates, was calculated to be 1.5×10^{-3} .

External occupational exposures were calculated using area TLD measurements. Concentrations were corrected for background, averaged for the plant, and calculated using a forty hour work week for the duration of time the badges were in service. The resulting maximum occupational external exposure for an individual was 0.024 rems for the first half of 1986. (See section 7.2.3).

2.0 (continued)

The calculations that will be utilized in determining occupational exposure are from the USNRC Regulatory Guide 8.30; "Health Physics Surveys in Uranium Mills" and from 10 CFR 20.

The regulatory limits used for the Crow Butte Project are as follows:

Internal Occupational Exposure

Radon Daughters: 4 WLM (annually)

Radon Particulate: 1×10^{-10} uCi/ml (annually)
0.063 uCi (quarterly)
0.0065 uCi (weekly)

Combination of Constituents:

Not to exceed unity when calculated by dividing the measurement made by the MPC for that constituent and adding the quotients of the constituents involved.

External Occupational Exposure

Gamma: 5 rems whole body (annually)
1.24 rems whole body (quarterly)

Per the permit application and the license granted for the Crow Butte Project, action levels are set at 25% of the above Maximum Permissible Concentrations.

summary of exposure records
FERRET EXPLORATION COMPANY OF NEBRASKA
CROW BUTTE PROJECT

RADIATION EXPOSURE SUMMARY

[illegible]

3.0 BIOASSAY

Bioassays were performed on all personnel and contractors who will be on site on a regular basis. The following results are the preliminary baseline analysis.

Samples were sent to an outside laboratory where analyses were performed in compliance with Regulatory Guides 4.15 and 8.22; "Quality Assurance for Radiological Monitoring Programs (normal operations)-Effluent Streams and the Environment" and "Bioassay of Uranium Mills", respectively. Quality Assurance and standard operating procedures for the outside laboratory and project quality assurance spikes are in the HPT/RSO's file at the mine site.

FERRET EXPLORATION COMPANY OF NEBRASKA, INC

CROW BUTTE PROJECT

RECORD OF BIOASSAY SAMPLE COLLECTION AND HANDLING

NAME	EMPLOYEE ID NUMBER	WORK CATEGORY	DATE BOTTLE DISTRIBUTED	DATE BOTTLE RETURNED	DATE SENT TO LABORATORY	NAME OF LABORATORY	DATE RESULTS RETURNED	RESULTS ($\mu\text{gW/l}$)
Brost, M.	508-70-6906	O/ office	6-6-86	6-6-86	6-6-86	Eneqy Laboratories, Inc.	6-25-86	< 0.5
Dirks, S.	506-88-4292	O/ office	6-6-86	6-6-86	6-6-86	Energy Laboratories, Inc.	6-25-86	< 0.5
Ferguson, B.	505-44-5334	M	6-6-86	6-6-86	6-6-86	Energy Laboratories, Inc.	6-25-86	< 0.5
Grantham, R.	505-80-5721	O/ HPT	6-6-86	6-6-86	6-6-86	Energy Laboratories, Inc.	6-25-86	< 0.5
Huffman, L.	252-94-9306	Op	6-6-86	6-6-86	6-6-86	Energy Laboratories, Inc.	6-25-86	< 0.5
Knodel, R.	520-52-1238	O/ office	6-6-86	6-6-86	6-6-86	Energy Laboratories, Inc.	6-25-86	< 0.5
Miller, C.	524-72-9638	O/ office	6-6-86	6-6-86	6-6-86	Energy Laboratories, Inc.	6-25-86	< 0.5
Morava, T.	507-72-1797	Op	6-6-86	6-6-86	6-6-86	Energy Laboratories, Inc.	6-25-86	2.1
Garling, S.A.	069-44-1935	L/ RSO	6-19-86	6-19-86	6-19-86	Energy Laboratories, Inc.	6-25-86	< 0.5
Collings, S.	304-46-5744	O/ Denver	6-17-86	6-17-86	6-17-86	Energy Laboratories, Inc.	7-10-86	1.3
Hamaker, P.	508-70-6467	Op	6-17-86	6-17-86	6-17-86	Energy Laboratories, Inc.	7-10-86	1.5

WORK CATEGORIES:

D - Dryer operation or maintenance

Op - Operator

M - Maintenance

L - Laboratory

W - Wellfield

O - Other (Explain)

4.0 INSPECTION LOG ENTRIES AND SUMMARY REPORTS OF DAILY, WEEKLY, AND MONTHLY INSPECTIONS

The HPT and lead operator conduct a daily walk-through (visual) inspection of all areas of the plant and working areas to insure proper implementation of good safety and health practices that will minimize unnecessary contamination and insure adherence to the S.O.P.'s. Areas of concern or problems are observed and noted on the Daily Walk-Through Inspection Form.

Operators on a daily shift basis are required to note, in a log book, any areas of concern or operational adjustments made during their shift. This is to insure smooth operations during shift changes and complete transfer and communication of information required for their shift.

An operator performs the daily inspection of the pond enclosure, embankments, measurement of pond(s) freeboard and leak detection systems, and records all information on the Waste Pond Data Sheet.

The HPT provides weekly and monthly summaries of her findings to the Plant Superintendent and RSO.

For the first half of 1986, plant, pond, and wellfields were under construction. Daily inspection of the pond and plant commenced on June 9, 1986 and June 16, 1986, respectively. There have been no notable problems regarding the pond impoundment or plant area. Daily reports are on file at the mine site.

Visitors/contractors, upon entering the restricted area, are required to sign in and receive hazard training. All visitors are escorted to their destination by an employee of Ferret Exploration Co. of Nebraska, Inc. Where necessary, contractors are escorted to their appropriate location of the restricted area. Before leaving the restricted area all visitors/contractors must perform a proper alpha survey and sign out.

5.0 DOCUMENTED TRAINING PROGRAM ACTIVITIES

An initial radiation health/safety short course was presented to the employees on site. The course was presented to provide radiation health/safety training prior to the MSHA New Miners Training course scheduled for July. Course outline and documentation are in the HPT/RSO's file.

MSHA Training Program for New Miners will be provided July 10 and 11, 1986 on site by Karen Gessner with the South Dakota Safety Council. The course will include:

- 1) Rights of miners
- 2) Transportation controls and communication systems
- 3) Introduction to the work environment
- 4) Escape and emergency evacuation plan
- 5) Ground control (trenching), water hazards, night work

5.0 (continued)

- 6) Self rescue and respiratory devices
- 7) Health
- 8) Hazard recognition
- 9) Electrical hazards
- 10) First aid

The two days will incorporate the above along with three hours of radiation safety training presented by the HPT and RSO. The course will include:

- 1) Fundamentals of Health Protection (definitions)
 - a. Radiological vs. toxic
 - b. Inhalation/ingestion of radon daughters and uranium particulates
 - c. ALARA concepts
- 2) Personnel Hygiene
 - a. Protective clothing
 - b. Proper hygiene: washing hands, face, etc.
 - c. Eating, drinking, and smoking in designated areas
- 3) Facility Provided Protection and Survey Equipment
 - a. Cleanliness of work area
 - b. Ventilation systems
 - c. Standard operating procedures
 - d. Personnel monitor and how to use it
- 4) Health Protection Measurements
 - a. Site specific areas
 - b. Radon gas
 - c. Radon daughters
 - d. Removable fixed alpha
 - e. Beta/gamma
 - f. Prenatal exposure risks
 - g. Bioassays
- 5) Radiation Protection Regulations
 - a. MSHA and NRC
 - b. Employee rights, 10 CFR 19

Prior to commencement of operations, operators will receive in excess of eight hours of task training. The training will be provided by the Plant Superintendent, Charles Miller. The following areas will be covered:

- 1) Project/Process Identification and Definition
- 2) Plant Production Operation
 - a. Equipment identification
 - b. Flow lines identified in facility
 - c. Standard operating procedures
 - d. Protocol/paperwork, work orders, etc.

5.0 (continued)

- 3) Hazard Identification
 - a. Chemicals
 - b. Electrical
 - c. Health/radiological

During the training the employees will be evaluated with verbal and written tests. Employees will be encouraged to ask questions. Available for questions during training and operations will be Ralph Knode, Charles Miller, Rhonda Grantham, and Sheryl Garling.

Documentation for the MSHA, Radiation Safety, and S.O.P.'s for task training will be on file at the mine site in the HPT/RSO's file.

6.0 RADIATION SAFETY MEETING SUMMARY

As indicated in Section 5.0, radiation safety, health, and task training will be provided to all the operators and staff. Task training will be updated regularly to familiarize operators with modifications and process adjustments. Radiation/safety training meetings will be performed every two months for all operators. Emphasis on radiological health hazards will be reviewed to provide operators a continuing education on health, hygiene, and site specific areas of concern. Operators will be given ample time for questions and comments. In addition, site and process specific safety precautions regarding, but not limited to, chemical, electrical, health/first aid, and specific operator controls/monitoring systems will be addressed.

All documentation will be held on site in the HPT/RSO's file.

7.0 RADIOLOGICAL SURVEY AND SAMPLING

7.1 Environmental

7.1.1 Airborne Radionuclides (Particulate)

Four locations have been established for predominant wind directions (AM-1 and AM-2), least prevalent wind direction and background (AM-7), and one monitor to determine any increase in airborne radionuclides near the town of Crawford (AM-6). Samples are taken continuously one week per month (3 filters per quarter) through a filter at approximately 20 liters per minute air flow. Filters are sent to an outside laboratory on a quarterly frequency to be analyzed for natural uranium, thorium 230, radium 226, and lead 210. Attached summary sheets provide data from 1982, 1983, 1984, 1985, and the first and second quarters of 1986. As plant operations have not commenced by the end of the first half of 1986, mean values presented will be the established background levels.

7.1.2 Radon Gas

Radon gas is measured at the above identified monitoring locations. Three consecutive air sample composites are collected each month: representing two 48 hour and one 72 hour composites. Radon 222 is analyzed by the HPT by using scintillation cells and an Eberline SAC-R5 alpha detector. Attached summary sheets provide data from 1982, 1983, 1984, 1985, and the first and second quarters of 1986.

The values for the airborne radionuclides and radon gas should be reviewed and utilized for background measurements since operations had not yet commenced as of June 30, 1986. All data is available at the mine site in the HPT/RSO's file.

7.1.3 Gamma

Gamma radiation is measured at each of the monitoring stations using an area TLD monitor. The area TLD's were set out in June, 1986. The attached summary sheet lists data for June, 1986.

7.1.1

RADIONUCLIDES IN AIR

Summary of (2nd Quarter) 1982
Through (2nd Quarter) 1986

FERRET EXPLORATION COMPANY OF NEBRASKA, INC.

CROW BUTTE PROJECT

Monitoring Station		Natural Uranium $\times 10^{-16}$ uCi/ml	Thorium- 230×10^{-16} uCi/ml	Radium- 226×10^{-16} uCi/ml	Lead- 210 $\times 10^{-16}$ uCi/ml
AM-1	Mean	28.3	155.9 $\pm$ 84	20.7 $\pm$ 15.1	147.3 $\pm$ 79.7
	Standard Deviation	42.7	306.2 $\pm$ 116	43.5 $\pm$ 16.1	89.3 $\pm$ 87.7
	Minimum	6.1	0.019.94	0.0 $\pm$ 3.6	5 $\pm$ 42
	Maximum	145	992 $\pm$ 307	162 $\pm$ 44	299 $\pm$ 197
AM-2	Mean	18.6	114.3 $\pm$ 65.3	7.7 $\pm$ 11.5	159.8 $\pm$ 76.7
	Standard Deviation	23.9	152.2 $\pm$ 87.6	9.0 $\pm$ 11.3	150.7 $\pm$ 97.6
	Minimum	0.686	0 $\pm$ 3	0.0 $\pm$ 3.6	0.0 $\pm$ 3.6
	Maximum	76	420 $\pm$ 90	55 $\pm$ 21	579 $\pm$ 326
AM-6	Mean	29.1	187.2	8.52 $\pm$ 8.9	150.7 $\pm$ 70
	Standard Deviation	51.8	336.1	13.7 $\pm$ 9.8	123.1 $\pm$ 80
	Minimum	0.0	0.0 $\pm$ 18	0.0 $\pm$ 3.6	0.0 $\pm$ 3.6
	Maximum	192	1210 $\pm$ 150	55 $\pm$ 20	399 $\pm$ 23
AM-7	Mean	22.4	108.5 $\pm$ 53.7	24.4 $\pm$ 10.3	193.1 $\pm$ 74.6
	Standard Deviation	41.8	234.2 $\pm$ 75.6	55.9 $\pm$ 11.3	150.5 $\pm$ 92.9
	Minimum	0.0	2.31 $\pm$ 4.61	0.0 $\pm$ 3.6	0.0 $\pm$ 3.6
	Maximum	145	954 $\pm$ 300	224 $\pm$ 41	470 $\pm$ 289

RADIONUCLIDE CONCENTRATIONS IN AIR
 SAMPLES COLLECTED IN THE AREA
 FERRET EXPLORATION CO. OF NEBRASKA, INC.
 CROW BUTTE PROJECT

Station Location		Natural Uranium $\times 10^{-16}$ uCi/ml	Thorium- $^{230}\times 10^{-16}$ uCi/ml	Radium- $^{226}\times 10^{-16}$ uCi/ml	Lead-210 $\times 10^{-16}$ uCi/ml	Volume of Air Sampled M ³
AM-1	2nd Quarter 1982	1.43	0.0+/-9.94	2.49+/-1.24	108+/-22.4	2,087
	3rd Quarter 1982	.643	26.3+/-9.11	1.34+/-0.730	138+/-8.89	2,463
	4th Quarter 1982	51.8	5.21+/-5.21	2.89+/-1.16	245+/-16.2	2,418
	1st Quarter 1983	9.7+/-1.0	3+/-3	2+/-1	79+/-7	2,371
	2nd Quarter 1983	5+/-3	1+/-2	1+/-1	39+/-6	2,357
	3rd Quarter 1983	3.6+/-0.5	3.7+/-1.6	4.4+/-1/6	270+/-20	2,431
	4th Quarter 1983	Lost Samples				
	1st Quarter 1984	5.3	8.8+/-7.9	12+/-8	231+/-36	563
	2nd Quarter 1984	145	246+/-257	7+/-41	127+/-263	552
	3rd Quarter 1984	84.31	8+/-80	2+/-14	5+/-42	1,124
	4th Quarter 1984	10.8	8.0	2+/-32	200+/-16	1,130
	1st Quarter 1985	2.4	119+/-50	0.0+/-3.6	115+/-39	555
	2nd Quarter 1985	1.21	829+/-280	7+/-10	24+/-160	561
	3rd Quarter 1985	91	992±307	162±44	226±172	561
	4th Quarter 1985	<11	<16	9±9	299±197	582
	1st Quarter 1986	<23	220±80	89±24	130±210	553
	2nd Quarter 1986	<6.1	<9.1	27±13	120±60	551
	3rd Quarter 1986					
	4th Quarter 1986					

RADIONUCLIDE CONCENTRATIONS IN AIR
 SAMPLES COLLECTED IN THE AREA
 FERRET EXPLORATION CO. OF NEBRASKA, INC.
 CROW BUTTE PROJECT

Station Location		Natural Uranium $\times 10^{-16}$ uCi/ml	Thorium- 230 $\times 10^{-16}$ uCi/ml	Radium- 226 $\times 10^{-16}$ uCi/ml	Lead-210 $\times 10^{-16}$ uCi/ml	Volume of Air Sampled M ³
AM-2	2nd Quarter 1982	3.54	0.0+/-9.68	2.58+/-1.94	86.4+/-21.9	2,108
	3rd Quarter 1982	.686	16.1+/-5.71	1.04+/-0.736	140+/-9.66	2,309
	4th Quarter 1982	4.94	1.74+/-6.37	2.32+/-1.16	225+/-16.2	2,417
	1st Quarter 1983	2.5+/-1.0	0+/-3	2+/-1	84+/-7	2,371
	2nd Quarter 1983	76+/-8	1+/-1	1+/-1	110+/-10	2,351
	3rd Quarter 1983	3.2+/-0.7	2.4+/-4.0	4.0+/-1.2	270+/-20	2,432
	4th Quarter 1983	Lost Samples				
	1st Quarter 1984	5.3	1.2+/-3.6	16+/-9	195+/-36	563
	2nd Quarter 1984	41	246+/-257	3+/-34	579+/-326	553
	3rd Quarter 1984	60.16	19+/-30	11+/-21	75+/-13	1,125
	4th Quarter 1984	10.0	315+/-39	5+/-32	352+/-19	1,130
	1st Quarter 1985	2.4	0.0+/-18	0.0+/-3.6	0.0+/-3.6	561
	2nd Quarter 1985	1.21	398+/-219	7+/-10	17+/-160	561
	3rd Quarter 1985	46	182±189	34±20	206±179	561
	4th Quarter 1985	< 11	77±100	9±16	182±175	583
	1st Quarter 1986	< 23	420±90	55±21	34±154	553
	2nd Quarter 1986	< 6.1	150±70	17±10	< 1.8	551
	3rd Quarter 1986					
	4th Quarter 1986					

RADIONUCLIDE CONCENTRATIONS IN AIR
 SAMPLES COLLECTED IN THE AREA
 FERRET EXPLORATION CO. OF NEBRASKA, INC.
 CROW BUTTE PROJECT

Station Location		Natural Uranium $\times 10^{-16}$ uCi/ml	Thorium- $^{230}\times 10^{-16}$ uCi/ml	Radium- $^{226}\times 10^{-16}$ uCi/ml	Lead-210 $\times 10^{-16}$ uCi/ml	Volume of Air Sampled M ³
AM-6	2nd Quarter 1982	0.7	11.9+/-12.6	1.40+/-1.40	61.5+/-21.0	2,047
	3rd Quarter 1982	.708	17.1+/-6.49	1.18+/-0.826	147+/-9.86	2,236
	4th Quarter 1982	2.47	3.48+/-11.6	1.74+/-1.16	167+/-15.1	2,416
	1st Quarter 1983	0.0+/-1.0	2+/-3	1+/-1	110+/-8	2,371
	2nd Quarter 1983	3+/-3	21+/-3	3+/-1	230+/-10	2,356
	3rd Quarter 1983	4.0+/-0.5	0.1+/-4.9	2.0+/-1.2	279+/-20	2,432
	4th Quarter 1983	Lost Samples				
	1st Quarter 1984	26	11+/-26	12+/-9	194+/-35	567
	2nd Quarter 1984	57	306+/-162	4+/-34	169+/-267	555
	3rd Quarter 1984	108.15	8+/-25	1+/-14	5+/-46	1,127
	4th Quarter 1984	192	414+/-42	20	399+/-23	1,131
	1st Quarter 1985	7.26	0.0+/-18	0.0+/-3.6	0.0+/-3.6	560
	2nd Quarter 1985	1.20	662+/-259	7+/-10	3+/-100	562
	3rd Quarter 1985	23	294±209	14±17	64±156	559
	4th Quarter 1985	< 11	26±84	< 3	377±185	582
	1st Quarter 1986	< 23	1210±150	55±20	75±160	554
	2nd Quarter 1986	6	< 9.1	10±10	130±60	549
	3rd Quarter 1986					
	4th Quarter 1986					

RADIONUCLIDE CONCENTRATIONS IN AIR
 SAMPLES COLLECTED IN THE AREA
 FERRET EXPLORATION CO. OF NEBRASKA, INC.
 CROW BUTTE PROJECT

Station Location		Natural Uranium $\times 10^{-16}$ uCi/ml	Thorium- $^{230}\times 10^{-16}$ uCi/ml	Radium- $^{226}\times 10^{-16}$ uCi/ml	Lead- 210 $\times 10^{-16}$ uCi/ml	Volume of Air Sampled M^3
AM-7	2nd Quarter 1982	0.7	4.47+/-22.4	7.67+/-3.20	125+/-23.9	2,127
	3rd Quarter 1982	.649	241+/-27.0	1.08+/-0.541	137+/-9.03	2,442
	4th Quarter 1982	2.46	2.31+/-4.61	2.31+/-1.73	197+/-24.2	2,427
	1st Quarter 1983	0.0+/-1.0	5+/-3	1+/-1	128+/-9	2,370
	2nd Quarter 1983	8+/-3	8+/-3	1+/-1	85+/-8	2,356
	3rd Quarter 1983	3.2+/-0.6	8.9+/-2.8	1.6+/-0.8	262+/-16	2,431
	4th Quarter 1983	Lost Samples				
	1st Quarter 1984	5.3	7.1+/-1.8	3.5+/-7.0	283+/-35	564
	2nd Quarter 1984	145	29+/-58	3+/-23	470+/-289	553
	3rd Quarter 1984	108.37	59+/-36	12+/-23	62+/-30	1,124
	4th Quarter 1984	10	30+/-30	20	458+/-21	1,130
	1st Quarter 1985	7.24	68+/-57	0.0+/-3.6	0.0+/-3.6	561
	2nd Quarter 1985	3.62	40+/-148	10+/-10	24+/-160	561
	3rd Quarter 1985	23	954±300	17±17	246±179	561
	4th Quarter 1985	< 11	98±62	16±9	371±186	581
	1st Quarter 1986	23	140±70	224±41	240±160	553
	2nd Quarter 1986	< 6.1	41±34	70±10	< 1.8	549
	3rd Quarter 1986					
	4th Quarter 1986					

7.1.2

RADON GAS

Summary of (2nd Quarter) 1982
Through (2nd Quarter) 1986

FERRET EXPLORATION COMPANY OF NEBRASKA, INC.

CROW BUTTE PROJECT

Monitoring Station	Mean	Standard Deviation	Minimum	Maximum
AM-1	0.164	0.078	0	0.61
AM-2	0.149	0.047	0	0.68
AM-6	0.149	0.047	0	0.68
AM-7	0.163	0.064	0	1.41

AMBIENT RADON-222 CONCENTRATIONS
FERRET EXPLORATION CO.
OF NEBRASKA, INC.
CROW BUTTE PROJECT

Air Monitor
Station
Number

Radon-222 Concentrations
x 10⁻⁹ uCi/ml

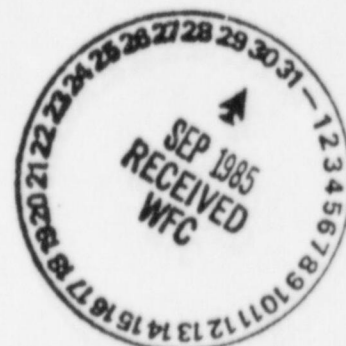
	Feb 1986	Mar 1986	Apr 1986	May 1986	Jun 1986
AM-1	0.11±0.18 0.32±0.54 0.37±0.45	0.08±0.09 0.14±0.09 0.22±0.09	0.06±0.18 0.14±0.18 0.16±0.09	0.12±0.27 0.09±0.27 0.26±0.18	0.04±0.0 0.04±0.0 0.09±0.09
AM-2	0.12±0.18 0.12±0.36 0.14±0.18	0.17±0.27 0.27±0.27 0.23±0.27	0.12±0.18 0.25±0.0 0.05±0.18	0.10±0.0 0.31±0.0 0.14±0.18	0.06±0.27 0.06±0.27 0.10±0.0
AM-6	0.10±0.09 0.43±0.45 0.14±0.0	0.33±0.36 0.16±0.18 0.17±0.36	0.08±0.27 0.13±0.27 0.07±0.09	0.23±0.27 0.04±0.0 0.09±0.18	0.10±0.18 0.05±0.09 0.17±0.27
AM-7	0.40±0.45 0.32±0.0 0.21±0.09	0.11±0.0 0.15±0.09 0.05±0.09	0.16±0.09 0.13±0.36 0.22±0.27	0.11±0.0 0.25±0.27 0.22±0.36	0.05±0.18 0.10±0.0 0.09±0.18

AMBIENT RADON-222 CONCENTRATIONS
WYOMING FUEL COMPANY
CROW BUTTE PROJECT

Air Monitor Station Number	Radon-222 Concentrations x 10 ⁻⁹ uCi/ml			
	Oct 1985	Nov 1985	Dec 1985	Jan 1986
AM-1	.56+/-0.0	Calibrated	.47+/-0.0	.36+/-0.0
	.17+/-0.27	Calibrated	.15+/-0.27	.36+/-0.45
	.23+/-0.27	Calibrated	.29+/-0.36	.22+/-0.18
AM-2	.18+/-0.36	Calibrated	.15+/-0.18	.11+/-0.45
	.11+/-0.0	Calibrated	.27+/-0.27	.21+/-0.27
	.36+/-0.0	Calibrated	.39+/-0.45	.08+/-0.0
AM-3	Not	Not	Not	Not
AM-4	Sampled	Sampled	Sampled	Sampled
AM-5	"	"	"	"
AM-6	.04+/-0.09	Calibrated	.15+/-0.0	.04+/-0.18
	.30+/-0.18	Calibrated	.16+/-0.18	.68+/-0.48
	.08+/-0.27	Calibrated	.04+/-0.18	.13+/-0.18
AM-7	.09+/-0.27	Calibrated	.37+/-0.27	.55+/-0.18
	.06+/-0.18	Calibrated	.42+/-0.18	.15+/-0.45
	.05+/-0.0	Calibrated	.18+/-0.27	.33+/-0.0

AMBIENT RADON-222 CONCENTRATIONS
WYOMING FUEL COMPANY
CROW BUTTE PROJECT

Air Monitor Station Number	Radon-222 Concentrations $\times 10^{-9}$ uCi/ml					
	Apr 1985	May 1985	June 1985	July 1985	Aug 1985	Sept 1985
AM-1	.14+/- .18 .04+/- .18 .17+/- .18	.04+/- .27 .21+/- .18 .07+/- .18	.08+/- .18 .08+/- 0.0 .20+/- .09	.29+/- .09 .12+/- .27 .56+/- .36	.11+/- .18 .35+/- .27 .41+/- .45	.19+/- .19 .45+/- .18 .17+/- .18
AM-2	.12+/- .27 .02+/- 0.0 .09+/- 0.0	.11+/- .36 .22+/- .09 .06+/- .18	.11+/- 0.0 .14+/- .18 .08+/- .27	.10+/- .09 .13+/- .27 .18+/- .18	.06+/- .09 .30+/- .36 .09+/- .09	.26+/- .36 .09+/- .27 .09+/- 0.0
AM-3	Not	Not	Not	Not	Not	Not
AM-4	Sampled	Sampled	Sampled	Sampled	Sampled	Sampled
AM-5	"	"	"	"	"	"
AM-6	.16+/- .27 .14+/- .27 .14+/- .27	.34+/- 0.0 .31+/- .45 .14+/- .18	.05+/- .09 .09+/- .27 .01+/- .09	.27+/- .18 .09+/- .27 .10+/- 0.0	.11+/- .09 .10+/- 0.0 .19+/- .09	.27+/- .27 .11+/- 0.0 .02+/- .02
AM-7	.08+/- .36 .05+/- .36 .04+/- .09	.22+/- .09 .10+/- .27 .12+/- .18	.19+/- 0.0 .14+/- .18 .04+/- .18	1.41+/- .27 .08+/- 0.0 .23+/- .18	.13+/- .18 .29+/- .18 .16+/- .18	.15+/- .09 .07+/- .18 .30+/- .09



AMBIENT RADON-222 CONCENTRATIONS
WYOMING FUEL COMPANY
CROW BUTTE PROJECT

Air Monitor Station Number	Radon-222 Concentrations x 10 ⁻⁹ uCi/ml					
	Oct 1984	Nov 1984	Dec 1984	Jan 1985	Feb 1985	Mar 1985
AM-1	.14+/-0.09 .12+/-0.09 .24+/-0.09	.09+/-0.09 .14+/-0.09 .08+/-0.18	.14+/-0.09 .31+/-0.27 .21+/-0.09	.11+/-0.0 .01+/-0.0 .03+/-0.18	.04+/-0.09 .13+/-0.27 .11+/-0.09	.01+/-0.0 .10+/-0.09 .10+/-0.09
AM-2	.18+/-0.09 .25+/-0.09 .18+/-0.18	.11+/-0.0 .23+/-0.18 .08+/-0.0	.05+/-0.09 .18+/-0.0 .14+/-0.27	.06+/-0.18 .02+/-0.09 .07+/-0.09	.04+/-0.09 .15+/-0.09 .04+/-0.09	.09+/-0.09 .11+/-0.09 .01+/-0.09
AM-3	Not	Not	Not	Not	Not	Not
AM-4	Sampled	Sampled	Sampled	Sampled	Sampled	Sampled
AM-5	"	"	"	"	"	"
AM-6	.59+/-0.09 .12+/-0.18 .11+/-0.09	.08+/-0.09 .07+/-0.0 .18+/-0.09	.15+/-0.0 .21+/-0.09 .11+/-0.09	.17+/-0.27 .06+/-0.09 .02+/-0.09	.05+/-0.09 .07+/-0.09 .05+/-0.09	.08+/-0.09 .12+/-0.09 .03+/-0.09
AM-7	.10+/-0.09 .11+/-0.09 .12+/-0.09	.09+/-0.09 .10+/-0.09 .21+/-0.18	.09+/-0.09 .34+/-0.18 .05+/-0.0	.18+/-0.09 .08+/-0.18 .13+/-0.27	.07+/-0.09 .09+/-0.09 .01+/-0.09	.04+/-0.09 .06+/-0.09 .01+/-0.0

AMBIENT RADON-222 CONCENTRATIONS
WYOMING FUEL COMPANY
CROW BUTTE PROJECT

Air Monitor Station Number	Radon-222 Concentrations x 10 ⁻⁹ uCi/ml					
	Apr 1984	May 1984	June 1984	July 1984	Aug 1984	Sept 1984
AM-1	.02+/-0.18 .03+/-0.0 .02+/-0.09	.04+/-0.0 .07+/-0.09 .02+/-0.09	.04+/-0.09 .01+/-0.0 .03+/-0.09	.14+/-0.14 .05+/-0.0 .06+/-0.0	.07+/-0.09 .04+/-0.09 .08+/-0.18	.03+/-0.18 .07+/-0.0 .09+/-0.18
AM-2	.01+/-0.0 .04+/-0.09 .04+/-0.0	.05+/-0.0 .10+/-0.09 .07+/-0.09	.07+/-0.09 .03+/-0.09 .04+/-0.0	.09+/-0.09 .06+/-0.18 .06+/-0.18	.09+/-0.09 .16+/-0.0 .06+/-0.09	.11+/-0.0 .04+/-0.0 .02+/-0.09
AM-3	Not	Not	Not	Not	Not	Not
AM-4	Sampled	Sampled	Sampled	Sampled	Sampled	Sampled
AM-5	"	"	"	"	"	"
AM-6	.08+/-0.09 .06+/-0.09 .07+/-0.09	.10+/-0.18 .03+/-0.18 .03+/-0.18	.01+/-0.0 .08+/-0.09 .02+/-0.09	.10+/-0.18 .05+/-0.09 .10+/-0.0	.11+/-0.0 .13+/-0.09 .09+/-0.09	.11+/-0.09 .11+/-0.09 .05+/-0.0
AM-7	.10+/-0.0 .09+/-0.09 .03+/-0.09	.06+/-0.18 .03+/-0.09 .06+/-0.0	.07+/-0.09 .05+/-0.09 .06+/-0.0	.09+/-0.09 .04+/-0.0 .05+/-0.09	.08+/-0.09 .10+/-0.09 .07+/-0.09	.04+/-0.0 .11+/-0.0 .10+/-0.18

AMBIENT RADON-222 CONCENTRATIONS
WYOMING FUEL COMPANY
CROW BUTTE PROJECT

Air Monitor Station Number	Radon-222 Concentrations $\times 10^{-9}$ uCi/ml					
	Oct 1983	Nov 1983	Dec 1983	Jan 1984	Feb 1984	Mar 1984
AM-1	.16+/-0.0 .39+/-0.09 .16+/-0.18	.15+/-0.09 .10+/-0.09 .18+/-0.18	.12+/-0.27 .12+/-0.27 .61+/-0.0	.33+/-0.09 .37+/-0.54 .20+/-0.09	.14+/-0.09 .18+/-0.0 .28+/-0.18	.08+/-0.09 .04+/-0.18 .05+/-0.09
AM-2	.11+/-0.09 .20+/-0.09 .10+/-0.09	.41+/-0.09 .18+/-0.09 .23+/-0.18	.18+/-0.09 .30+/-0.18 .35+/-0.09	.22+/-0.27 .18+/-0.09 .30+/-0.09	.14+/-0.09 .24+/-0.18 .06+/-0.09	.06+/-0.09 .05+/-0.0 .05+/-0.09
AM-3	Not	Not	Not	Not	Not	Not
AM-4	Sampled	Sampled	Sampled	Sampled	Sampled	Sampled
AM-5	"	"	"	"	"	"
AM-6	.10+/-0.27 .20+/-0.09 .14+/-0.36	.11+/-0.18 .13+/-0.36 .22+/-0.0	.08+/-0.0 .11+/-0.09 .55+/-0.36	.24+/-0.09 .25+/-0.27 .27+/-0.36	.22+/-0.27 .12+/-0.27 .07+/-0.09	.08+/-0.0 .04+/-0.09 .08+/-0.09
AM-7	.11+/-0.36 .51+/-0.36 .09+/-0.09	.29+/-0.36 .15+/-0.36 .24+/-0.09	.54+/-0.54 .27+/-0.18 .18+/-0.09	.14+/-0.09 .32+/-0.09 .60+/-0.36	.16+/-0.18 .10+/-0.09 .10+/-0.18	.01+/-0.09 .05+/-0.09 .07+/-0.09

AMBIENT RADON-222 CONCENTRATIONS
WYOMING FUEL COMPANY
CROW BUTTE PROJECT

Air Monitor Station Number	Radon-222 Concentrations x 10 ⁻⁹ uCi/ml					
	Apr 1983	May 1983	June 1983	July 1983	Aug 1983	Sept 1983
AM-1	Not	-.12+/--.27	.06+/--.09	.17+/--.18	.04+/--.09	.16+/--.09
	Sampled	.11+/--.09	.17+/--.27	.19+/--.09	.08+/--.18	.15+/--.09
		.13+/--.27	.04+/--.09	.10+/--.36	.03+/-0.0	.19+/--.36
AM-2	Not	.06+/-0.0	.19+/--.18	.04+/--.09	.24+/--.27	.02+/-0.0
	Sampled	.15+/-0.0	.11+/--.18	.16+/--.27	.17+/--.36	.13+/--.27
		.13+/--.27	.21+/--.18	.15+/--.09	.21+/--.18	.19+/--.36
AM-3	Not	Not	Not	Not	Not	Not
AM-4	Sampled	Sampled	Sampled	Sampled	Sampled	Sampled
AM-5	"	"	"	"	"	"
AM-6	Not	.05+/--.09	.08+/--.36	.07+/--.27	.03+/-0.0	.05+/-0.0
	Sampled	.06+/-0.0	.05+/-0.0	.27+/--.18	.08+/--.27	.09+/--.27
		.08+/--.18	.08+/--.36	.19+/--.18	.05+/-0.0	.10+/--.36
AM-7	Not	.07+/--.09	.10+/--.27	.07+/--.09	.16+/--.09	.09+/--.18
	Sampled	.05+/--.09	.04+/--.09	.13+/--.27	.16+/--.09	.25+/--.09
		.12+/-0.0	.08+/--.27	.12+/-0.0	.05+/--.09	.16+/--.09

AMBIENT RADON-222 CONCENTRATIONS
WYOMING FUEL COMPANY
CROW BUTTE PROJECT

Air Monitor Station Number	Radon-222 Concentrations $\times 10^{-9}$ uCi/ml					
	Oct 1982	Nov 1982	Dec 1982	Jan 1983	Feb 1983	Mar 1983
AM-1	.14+/- .36	.30+/- .63	.17+/- .72	.25+/- 0	.39+/- .36	.06+/- .09
	.08+/- .09	.14+/- .27	.48+/- .63	.14+/- .45	.33+/- .54	.08+/- 0
	.28+/- .45	.26+/- .72	.37+/- .63	.09+/- .27	.21+/- .27	.11+/- .09
AM-2	.38+/- .81	.47+/- 0.0	-.05+/- .36	.44+/- .09	.25+/- .45	.12+/- .27
	.27+/- .54	.60+/- .72	.44+/- .18	.09+/- .18	.16+/- .36	.04+/- .09
	.14+/- .18	.16+/- .63	.33+/- .72	.37+/- .45	.29+/- .36	.11+/- .36
AM-3	.50+/- 0.0	.23+/- .27	.09+/- .27	.23+/- .27	.08+/- .27	.22+/- .36
	.28+/- .45	.30+/- .72	.53+/- .63	.22+/- .36	.11+/- .18	.33+/- .27
	.21+/- .36	.18+/- .36	.15+/- .36	.21+/- .27	.09+/- .27	.11+/- .09
AM-4	.14+/- .45	.13+/- .18	.25+/- .09	.25+/- .54	.17+/- .18	.15+/- .36
	.52+/- .27	.35+/- .54	.27+/- .09	.07+/- .27	.09+/- .09	.22+/- .09
	.40+/- .54	.04+/- .18	.08+/- .54	.18+/- .36	.30+/- .18	.14+/- .36
AM-5	.20+/- .54	.18+/- .45	.13+/- .18	.26+/- .27	.24+/- .36	.05+/- .18
	.23+/- .27	.23+/- .45	.25+/- .54	.11+/- .36	.14+/- 0.0	.10+/- 0.0
	.21+/- .36	.61+/- .81	.25+/- .54	.05+/- .18	.25+/- .18	.10+/- 0.0
AM-6	.07+/- .36	.21+/- .27	.09+/- .36	.11+/- .18	.10+/- .09	.14+/- 0.0
	.50+/- .63	.40+/- .27	.28+/- .36	.05+/- .09	.06+/- .18	.08+/- .09
	.49+/- .27	.33+/- .54	.56+/- .54	.21+/- .27	.32+/- .18	.07+/- 18.0 <i>0.18</i>
AM-7	.21+/- .63	.29+/- .36	.32+/- .09	.10+/- .18	.09+/- .18	.24+/- .36
	.32+/- .36	.52+/- .45	.29+/- .36	.10+/- 0.0	.16+/- .36	.11+/- .36
	.38+/- .45	.30+/- .27	.19+/- .54	.09+/- .27	.07+/- .09	.21+/- .45

AMBIENT RADON-222 CONCENTRATIONS
WYOMING FUEL COMPANY
CROW BUTTE PROJECT

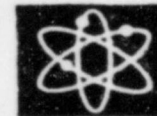
Air Monitor Station Number	Radon-222 Concentrations x 10 ⁻⁹ uCi/ml					
	Apr 1982	May 1982	June 1982	July 1982	Aug 1982	Sept 1982
AM-1	.02+/-0.25 .11+/-0.0 .01+/-0.20	.16+/-0.27 -1.03+/-0.27 .09+/-0.72	-.09+/-0.27 .01+/-0.18 .01+/-0.18	.07+/-0.36 .05+/-0.09 .21+/-0.18	.19+/-0.36 .10+/-0.09 .30+/-0.27	.06+/-0.36 .21+/-0.54 .49+/-0.45
AM-2	.05+/-0.18 N/A .34+/-0.38	.08+/-0.27 -.05+/-0.18 -1.45+/-0.09	0.0+/-0.09 -.22+/-0.36 .03+/-0.36	.11+/-0.36 .07+/-0.09 .14+/-0.09	.06+/-0.09 .11+/-0.27 .09+/-0.27	.09+/-0.63 .27+/-0.27 .18+/-0.36
AM-3	.04+/-0.0 .36+/-1.79 -.06+/-0.16	.15+/-0.45 -.10+/-0.18 -.12+/-0.09	.07+/-0.27 .12+/-0.36 .17+/-0.36	.13+/-0.36 .18+/-0.45 .01+/-0.09	.06+/-0.36 .10+/-0.27 .08+/-0.27	.08+/-0.54 .34+/-0.09 .34+/-0.27
AM-4	-.06+/-0.25 -.02+/-0.52 -.14+/-0.09	.08+/-0.27 .23+/-0.45 -.24+/-0.27	.01+/-0.09 .11+/-0.36 -.19+/-0.09	.08+/-0.18 .22+/-0.09 .20+/-0.45	.13+/-0.63 .07+/-0.36 .09+/-0.27	.16+/-0.63 .19+/-0.36 .21+/-0.0
AM-5	.11+/-0.27 -.65+/-0.81 .07+/-0.45	.27+/-0.27 -.13+/-0.36 .02+/-0.18	.03+/-0.18 -.18+/-0.09 .16+/-0.27	.17+/-0.36 .13+/-0.36 .17+/-0.45	.07+/-0.54 .13+/-0.18 .21+/-0.54	.17+/-0.18 .30+/-0.09 .35+/-0.72
AM-6	N/A .21+/-0.36 -.07+/-0.36	.25+/-0.45 -.09+/-0.36 -.15+/-0.54	.17+/-0.27 .07+/-0.18 .29+/-0.18	.30+/-0.36 .16+/-0.18 .05+/-0.27	.07+/-0.36 .38+/-0.54 .09+/-0.09	.27+/-0.54 .22+/-0.45 .44+/-0.0
AM-7	-.03+/-0.45 .14+/-0.54 .01+/-0.09	.03+/-0.45 -.12+/-0.27 .10+/-0.0	.22+/-0.45 .08+/-0.18 .02+/-0.09	.13+/-0.18 .03+/-0.27 .14+/-0.45	.35+/-0.72 .26+/-0.36 .25+/-0.18	.08+/-0.0 .27+/-0.27 .06+/-0.0

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 06/01/86 DATE ANNEALED 05/15/86 CUSTOMER NO. 6192
 DATE RETURNED 07/07/86 DATE READ 07/12/86 PAGE 1 OF 1



BADGE NUMBER	IDENTIFICATION	DOSIMETER READINGS (mrem)								
		FIRST	SECOND	THIRD	FOURTH	FIFTH	AVERAGE ±	2 σ	MREM/WEEK	FREQUENCY
1000	CONTROL	17	13	15	14	13	14.4	3.3	1.74	Q
1001	AM-1, RAB	14	17	13	13	13	14.0	3.5	1.69	Q
1002	AM-2, ½ mi N RAB	15	15	14	12	15	14.2	2.6	1.71	Q
1003	AM-6, Crawford	14	16	16	14	18	15.6	3.3	1.88	Q
1004	AM-7, Control	14	15	15	12	16	14.4	3.0	1.74	Q



• 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

DATE 07/18/86

CUSTOMER
 ATTENTION
 ADDRESS
 CITY

FERRET OF NEBRASKA
 RHONDA GRANTHAM
 P.O. BOX 169
 CRAWFORD

NE 69339

SIGNED _____

7.2 Site Monitoring - Operating Status

7.2.1 Radon Daughters

Survey for radon daughters will be performed on a monthly basis. Measurements have been made to establish natural background levels within the plant area.

7.2.2 Uranium Particulate

Survey for uranium particulate will be performed monthly within the plant structure. The HPT will perform the sampling and analysis on site using the gross alpha method. Measurement has been made to establish natural background levels.

Both measurements will be utilized along with employee occupancy time to derive occupational intake (internal) exposure levels.

7.2.3 Gamma

Gamma surveys will be performed on a monthly basis throughout the plant facility, office structure, and wellfield. The HPT will use a calibrated Mount Sopris Scintillometer. In conjunction with the monthly surveys, area dosimeters (TLD's) will be placed in specified plant, wellfield, and pond areas. They will be changed out quarterly. Surveys have been performed and provide natural background levels. TLD's were placed in service June 1, 1986, for the second quarter measurements.

Both measurements will be utilized along with employee occupancy time to derive occupational external radiation exposure levels.

All data and documentation is on file at the site in the HPT/RSO's file.

SURVEY PERIOD JUNE, 1986

[illegible]

REMARKS:

CROW BUTTE PROJECT
SECOND QUARTER 1986
QUARTERLY REPORT

SURVEY PERIOD JUNE 1986

[illegible]

eberline

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

FLU RATE MONITOR REPORT

DATE ISSUED 06/01/86 DATE ANNEALED 05/15/86 CUSTOMER NO. 6184
DATE RETURNED 07/07/86 DATE READ 07/12/86 PAGE 1 OF 1



BADGE NUMBER	IDENTIFICATION	DOSIMETER READINGS (net mrem)								
		FIRST	SECOND	THIRD	FOURTH	FIFTH	AVERAGE $\pm$	2 σ	MREM/WEEK	FREQUENCY
0000	CONTROL	16	18	17	24	15	18.0	7.1	2.17	Q
0001	CONTROL - trailer	18	13	20	20	17	17.6	5.8	2.12	Q
0002	CONTROL - trailer	15	16	17	16	16	16.0	1.4	1.93	Q
0003	PLANT - @prod.controls	111	96	105	138	116	113.2	31.5	13.66	Q
0004	PLANT- IX Column	106	108	126	133	96	113.8	30.5	13.73	Q
0005	PLANT- Eluant Tank area	31	25	25	27	21	25.8	7.3	3.11	Q
0006	PLANT-uranium tank area	25	24	21	23	22	23.0	3.2	2.77	Q
0007	PLANT -@ Prod. Surge tank	66	67	71	74	55	66.6	14.5	8.03	Q



- 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

CUSTOMER
ATTENTION
ADDRESS
CITY

FERRET OF NEBRASKA
RMCNDA GRANTHAM
P.O. BOX 169
CRAWFORD

NE 69339

SIGNED B. L. L. L.

DATE 07/18/86

8.0 SOLID/LIQUID WASTES - EFFLUENT

8.1 Contaminated

Effluent generated from the mine site in the form of solids (spent resin, resin fines, miscellaneous pipe and fittings, etc.) will be separated into two categories as follows:

- 1) Wastes which can be decontaminated and reclassified as non-contaminated waste.
- 2) Wastes which cannot be easily decontaminated.

Category "1" wastes will be decontaminated using the best method available (acid wash and disposing of wash water to the sump to be discharged to the ponds). Radiation levels will be below those stated in the NRC Branch Technical Position paper "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use of Termination License By-Product Source, or Special Nuclear Material" (NRC, 9/84).

A survey will be performed on the decontaminated equipment to assure all contamination has been removed and is within the guidelines to be released to an unrestricted area, documented, and disposed of at the nearest sanitary landfill.

Category "2" wastes will be stored on a curbed concrete pad until they can be shipped to an NRC licensed disposal site.

Effluent generated from the mine site in the form of liquid (process wastes and bleed water) will be stored in the evaporation ponds. Evaporation pond levels, leak detection systems, etc., are measured on a daily basis (see Section 3.2).

No waste has been discharged to the evaporation ponds during the first half of 1986. Rain water and snow melt has accumulated in both cells. The Nebraska Department of Environmental Control has approved the discharge of rain/snow water for irrigation on newly seeded areas.

Quarterly pond samples will be taken and analyzed for the specified constituents per License Condition #22. A second quarter 1986 sample was taken and the results are attached.

Leak detection systems are checked daily. If the water level is 6" above the top of the sump (enough volume to take a sample), a sample will be taken from the stand pipe and analyzed. Procedures for notification, analysis, and transfer will be followed per License Condition #23.

8.2 Non-Contaminated

Solid wastes (boxes, office wastes, etc.) are collected on site on a regular frequency and disposed of at the nearest licensed sanitary landfill.

Domestic liquid wastes (restroom water, closets and kitchen/lunchroom) are disposed of in a septic system designated to accomodate the facility.

Documentation on the contaminated/non-contaminated solid wastes and pond effluents are in the HPT/RSO's file at the mine site.

9.0 REPORTS ON OVER EXPOSURE OF WORKERS

Construction activities occurred during the first half of 1986 with no mining activity present.

There were no over exposures of workers at the Crow Butte site during the first half of 1986.

10.0 OPERATING PROCEDURES

Standard Operating Procedures (SOP) have been prepared. The SOP's are available to all staff and management involved with the process and operations of the facility. All procedures are approved/accepted by the Plant Superintendent, Health Physics Technician, and the Corporate Radiation Safety Officer.

The procedures are available to all the operators. They are located in both the plant and office structure.

To date, seven process flow changes have been made and applied for as a license amendment. They are:

- Change the filter between the production surge tank and ion exchange system to an alternative filter (optional).
- Change the addition of oxygen from the main injection lines to individual injection lines.
- Add an alternate flow line from the R.O. permeate to the injection line.
- Add an alternate flow line from the uranium slurry storage to the vanadium recovery tank (optional).
- Add an alternate flow line from the uranium precipitation to the elution circuit.
- Option of storing decant in the vanadium recovery (optional).
- Addition of sodium bicarbonate to the elution circuit.

All changes are considered to be minor with no apparent additional radiological health risk assessed to them. The changes will be incorporated into the ALARA program as initially planned and presently enforced.

Documentation of the SOP's and their changes/modifications are held on site in the HPT/RSO's file.

Ferret
Exploration
Company of
Nebraska, Inc.

04008829380E



40-8829
RETURN ORIGINAL TO PDR, HQ

August 28, 1986

Mr. Ray Gonzales
U.S. Nuclear Regulatory Commission
Uranium Recovery Field Office
P.O. Box 25325
Denver, CO 80225



Re: Semi-Annual ALARA Audit
SUA-1441

Dear Mr. Gonzales:

Enclosed is a copy of the semi-annual ALARA Audit for the period January 1, 1981 through June 30, 1986.

Sincerely,

Stephen P. Collings

Stephen P. Collings
Vice-President

SPC/tl
Encl.

cc: Thor Gjelsteen
Ralph Knode

FEE NOT REQUIRED

DESIGNATED ORIGINAL

Certified By Mary C. Hood

849