Fansteel
Metals

February 7, 1992

RECEIVED
FEB 10 1992
REGION IV

Mr. L. J. Callan, Director
Div. of Radiation & Safeguards
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-3064

RE: Docket #40-7580
License No. SMB-911

Dear Mr. Callan:

I am in receipt of your letter of 27 Jan. 92 wherein you request further explanation o Level IV violations set forth in an inspection by your Mr. G.M. Vasquez in April 1991.

Enclosed you will find each violation addressed and a final tabulation of measures taken to ensure compliance.

Should you have any questions, please feel free to contact me at any time.

Sincerely,

JOHN J. HUNTER
Corp. Mgr., Process Eng. &
Facilities Construction

JJH/bsm

enc.

A. <u>Violation</u>: The Process Engineering Manager and Chemical Operations Manager had not been part of the Radiation Safety Committee between October 1989 and July 1990, a period of 9 months before the licensee requested an amendment to their license.

1. <u>Reason for Violation</u>: Formal closure of the plant in February 1990. The Process Engineering Manager was a part of the Radiation Safety Committee through March 1990, at which time his job was terminated and the position was eliminated. The Chemical Operations Manager was part of the Radiation Safety Committee thorough April 1990, at which time he retired due to the plant closure and no plant processing operations. His position was also eliminated. The direction of plant operations was in question during this time until June 1990, at which time a letter was sent to your Mr. C. Haughney, advising him that Mr. J. Hunter, Corporate Manager of Process Engineering, would be in charge of Muskogee remedial activities. Following this letter, a new organizational chart was sent to your office in July 1990, depicting the make-up of the Radiation Safety Committee. It is fair to say that from March/April until June of 1990 those few remaining employees were unaware that the composition of the committee was a license requirement; however, as you can see from the above, once recognized, it was corrected immediately.

2. <u>Corrective Steps Taken and Results Achieved</u>: The key personnel left at the plant after the closure have assumed the responsibilities of the Plant Radiation Safety Committee. The plant PRSO and Alternate PRSO are trained and serve in the respective positions. The Plant Operations Manager serves as the Plant Safety Director.

3. <u>Corrective Steps That Will Be Taken to Avoid Further Violations</u>: Documentation will be supplied to the NRC when there is a change in the organizational structure of the Radiation Safety Committee. This process will be handled in a timely manner.

4. <u>Date When Full Compliance Will Be Achieved</u>: Full compliance was achieved in July 1990.

B. Violation: The licensee failed to make surveys of radioactive materials in the air during the actual removal of equipment from the Ball Mill Room.

1. Reason for violation:
Records of air sampling and wipe samples in the Ball Mill/Vibratory Mill room were provided to the inspector. This violation is being disputed.

2. The removal of equipment from the Ball Mill/Vibratory Mill room started in late June, 1990 and ended in mid July, 1990. The mills and auxiliary equipment were vacuumed before dismantling using HEPA filtered vacuums. Wipe samples and air samples were taken once per week (Section VII, C. #2 - Internal Exposure). Exhibit 1 will show levels of radioactivity in the BM/VM room prior to the installation of the exhaust system. Exhibit 2 will show levels of radioactivity in the BM/VM room before removal of equipment. Exhibit 3-5 will show levels of activity in the BM/VM room during equipment removal. These records were provided to the inspector and the clean-up procedure was also explained.

3. Because there was no violation, corrective steps to avoid further violations and date of full compliance is not necessary.

Exhibit 1

Date	Time	Sample	Bkg	Std	Inst	Cpm			X̄	X̄-B	SD	Anal
10/4/85		Am-241 (18420)	40	1200	E-140							
		Th-230 (2570)	40	360								
		Th-230 (25100)	40	3200								
		Coveralls	40									30 cpm
10/11/85	1	Am-241 (18420)	.1	5544	PC-4							
.3	1	Th-230 (2570)	.1	1757								
	1	Th-230 (2510)	.1	16767								
10.	10	BM Air	.1			2.6	1.4	1.3	1.7	1.6	.7	$1 \pm .08 \times 10^{-12}$ μCi/ml
	10	BM Ex Air	.1			2.2	1.8	1.8	1.9	1.8	.2	$1.1 \pm .02 \times 10^{-11}$ μCi/ml
	10	Chem C Air	.1			7.0	4.9	5.2	5.7	5.6	1.1	$6 \pm 1.1 \times 10^{-12}$ μCi/ml
	10	BM Wipe	.1			7.1	8.7	10.2	8.7	8.6	1.6	.3 ± .05 dpm/cm²
	10	Chem C Wipe	.1			7.7	7.3	8.3	7.8	7.7	.5	.26 ± .02 dpm/cm²
	10	Thermite Wipe	.1			1.0	1.1	1.4	1.2	1.1	.2	.04 ± .007 dpm/cm²
	10	Warehouse Wipe				.8	1.2	.6	.9	.8	.3	.03 ± .01 dpm/cm²
		Am-241 (18420)	40	1200	E-140							
		Th-230 (2570)	40	340								
		Th-230 (25100)	40	3500								
		Coveralls	40									40 cpm
10/17/85	1	Am-241 (18420)	.1	5969	PC-4							
.32	1	Th-230 (2570)	.1	1599								
	1	Th-230 (25100)	.1	16944								
10.	10	BM Air	.1			1.9	1.4	1.4	1.6	1.5	.3	$9 \pm .3 \times 10^{-12}$ μCi/ml
	10	BM Ex Air	.1			1.7	1.2	1.4	1.4	1.3	.25	$7.8 \pm .2 \times 10^{-12}$ μCi/ml
	10	Chem C Air	.1			2.4	2.3	2.0	2.2	2.1	.2	$2 \pm .2 \times 10^{-12}$ μCi/ml
	10	BM Wipe	.1			7.7	7.5	6.8	7.3	7.2	.5	.23 ± .02 dpm/cm²
	10	Chem C Wipe	.1			2.2	2.5	1.9	2.2	2.1	.3	.07 ± .01 dpm/cm²
	10	Thermite Wipe	.1			1.6	1.6	1.2	1.5	1.4	.2	.04 ± .006 dpm/cm²
	10	Warehouse Wipes	.1			1.2	1.3	1.2	1.2	1.1	.1	.03 ± .003 dpm/cm²
		Am-241 (18420)	40	1300	E140							
		Th-230 (2570)	40	363								
		Th-230 (25100)	40	3200								
		Coveralls										30 cpm

Exhibit 2

	PC-4			ESP-1	
Background	0.4-0.3-0.5	0.4		~~1.20+01~~-3.00+00-4.00+00-3.0	
Th_{230} Low	2355-2492-2291-2406	2386	.93	8.20+02-8.22+02-~~8.29+02~~ 8.23+02	821
Th_{230} High	22785-23226-23014-23405	23107	.92	~~8.26~~ 7.37+03-7.67+03-7.88+03	76
Am_{241}	8341-8519-8602-8862-8666	8643	.47	2.34+03-2.43+03-2.32+03	236

Air

Chem C	3.1-3.0-3.2	3.1	.10	2.82×10^{-13}	
Chem C Exh	1.6-1.3-1.4	1.43	.15	1.01×10^{-13}	
Ball mill	4.1-4.4-4.3	4.27	.15	3.92×10^{-13}	
Ball mill Exh	1.2-1.0-1.1	1.1	.10	6.9×10^{-14}	
Vib mill	Down				
Vib mill Exh	"				

Wipe

Chem C	5.4-4.5-4.2 =	4.7	.62	1.31+02-2.59+02-3.02
Ball mill	14.4-13.9-13.2 =	13.8	.60	8.10+01-8.50+01-6.30
Vib mill	23.0-20.8-22.2 =	22.0	1.11	2.18+02-5.10+02-6.53
Thermite	15.9-18.4-21.8 =	18.7	2.96	5.30+01-9.60+01-1.30
Warehouse	0.4-0.5-0.4 =	.43	.06	1.07+02-4.00+00-1.70

Coveralls	10-19	10-21
Basket	.6-.5-.5	.4-.4 .4

6-26-90

Exhibit 3

RADIATION

	PC4		ESP-1	
BACKGROUND	0.4-0.4-0.3	.367	5.00+00 - 5.00+00 - 8.00+00	6.
Th_{230} low	2570 2064 - 2012 - 2006	2229	2.30+03 - 2.26+03 - 2.33+03	2296.7 5
Th_{230} high	25104 23341 - 23453 - 23216	23336.7	2.12+04 - 2.10+04 - 2.14+04	21200 54
Am_{241}	18440 8119 - 8201 - 8211 - 8256	8222.7 .446	9.52+03 - 9.48+03 - 9.64+03	9546.7 .51

AIR.

CHEM "C" Down

CHEM"C"EXHAUST Down

BALL MILL Down

BALL MILL EXHAUST Down

VIB MILL 2.6 - 2.3 - 2.5 = 2.47 .15 = 2.103 $1.23 \times 10^{-13} \pm .29$ µc/ml 3199 [illegible]

VIBMILL EXHAUST Removed

WIPE					
		9.03 .416 8.66	.1962.8	7.18+02 - 9.72+02 - 9.46+02	8[illegible]
CHEM "C"	8.7 - 9.5 - 8.9		.137 ± .35	3.66+01 - 3.02+01 - 4.47+01	55.3
BALL MILL	6.2 - 6.6 - 6.4	6.4 .2 6.03	.146 ± .45	1.83+02 - 1.02+02 - 9.00+01	145
VIB MILL	6.3 - 6.6 - 7.1	6.83 .21 6.46	.075 ± .5	7.05+01 - 5.75+01 - 1.18+02	82
THERMITE	3.6 - 3.3 3.7	3.7 .1 3.33	.0044 ± .15	2.61+01 - 1.31+01 - 1.53+01	19.[illegible]
WAREHOUSE	~~11.8 - 12.2 - 12.6 12.2 .4 11.48~~				
FURNACE	11.8 - 12.2 - 12.6	12.2 .4 11.73	.27 ± .18	2.25+02 - 1.38+02 - 6.75+01	143.6

COVERALLS

3.00+00 - 5.00+00 - 5.00+00

MISC

1-5-90

Exhibit 4

RADIATION

	PC4			ESP-1		
BACKGROUND	0.2-0.2-0.4	.2.66		5.00+02-8.00+00-8.00+02	7.00	
Th_{230} low (2570)	2228-2115-2180	2174	.85	2.37+03-2.46+03-2.33+03	2357	.93
Th_{230} high (25700)	23123-23352-27480	23312	.43	2.30+04-2.27+04-2.29+04	22567	.41
Am_{241} (18420)	8302-8355-8436	8364	.451	9.14+03-8.95+03-9.17+03	9087	.49

AIR

	PC4	ESP-1		
CHEM "C"	DOWN			
CHEM"C"EXHAUST	"			
BALL MILL	Removed	3.1-3.3-2.9 =3.1 .2 2.834	$1.63 \times 10^{-13} \pm .39$	31 fm
BALL MILL EXHAUST	"			
VIB MILL	"	2.8-2.2-2.6=2.53 .3 =2.264	$1.20 \times 10^{-13} \pm .6$	31 fm
VIBMILL EXHAUST	"			

WIPE

	PC4					ESP-1	
		2.5 .2	2.27	.05	.29		
CHEM "C"	2.7-2.5-2.3	2.73 .21	2.46	.055	.41	5.56+02-2.27+02-1.02+03	601
BALL MILL	2.8-2.9-2.5		3.36	.075	.45	1.15+02-2.43+02-1.75+02	177.7
VIB MILL	3.6-3.4-3.9	3.63 .25	3.66	.081	.41	3.92+02-1.28+02-2.40+01	181.3
THERMITE	4.0-4.1-3.7	3.93 .2	2.40	.053	.45	5.22+01-6.01+01-8.62+01	66.2
WAREHOUSE	2.4-2.8-2.8	2.67 .23	14.76	.33	.41	8.69+01-3.13+01-4.40+01	54.2
FURNACE	14.8-15.1-15.2	15.03 .21				2.56+02-1.65+02-6.05+02	34338

COVERALLS

2.00+00 – 3.00+00 – 6.20+00

MISC

7-12-90

Exhibit 5

RADIATION

PC4 ESP-1

BACKGROUND 0.4-0.1-0.3 .47 5.00+00-3.00+00-5.00+00 533

Th $_{230}$ low (2570) 2296-2278-2327 2300.3 .895 2.35+03-2.31+03-2.28+03 2313 90

Th $_{230}$ high (25500) 23501-23244-23463 23403 .93 1.97+04-1.97+04-1.93+04 19566 .78

Am $_{241}$ (18420) 8523-8420-8502-8531 8519.7 .462 8.83+03-8.96+03-8.85+03 8880 .47

AIR

CHEM "C" Down

CHEM"C"EXHAUST "

BALL MILL Removed 2.1-2.2-2.7=2.33 .32=1.86 1.05 x 10 $^{-13}$ ± .62 0.20

BALL MILL EXHAUST "

VIB MILL " 2.0-2.0-1.8=1.93 .12=1.4 8.26 x 10 $^{-14}$ ± .23 0.20

VIBMILL EXHAUST "

WIPE

CHEM "C" 5.6-5.8-5.8 5.73 .11 5.26 .12 ±.22

BALL MILL 14.8-14.7-14.6 14.7 .1 14.21 .31 .15 3.45+02-2.17+02-6.90+02 417

VIB MILL 14.1-13.6-13.6 13.77 .29 13.3 .29 .57 5.44+02-1.93+02-1.66+02 303

THERMITE 4.3-4.5-4.6 4.47 .15 4.0 .087 .29 1.90+02-8.75+02-5.49+02 538

WAREHOUSE 1.0-0.8-0.9 .9 .1 .43 .009 .19 3.13+01-1.57+01-1.44+01 20.5

FURNACE 10.8-11.2-10.9 10.97 .21 10.5 .23 .41 1.04+01-1.57+01-2.37+01 16.6

1.65+02-1.10+02-6.14+02 296

COVERALLS

3.00+00 - 5.00+00 - 6.00+00

MISC

Ball Mill Sand Blasted Outside 3.60+00 .055 dpm/cm²

Inside 140+01 .295 dpm/cm²

C. Violation: The licensee administered no written test for training conducted. A written test was not a inistered during the initial Radiation Safety training sessions.

1. Reason for violation:
The PRSO did not take into consideration that a test is required one time per year.

2. Corrective steps that have been taken and results achieved:
The assessment of Section VI, D - Personnel Training, has been achieved by the PRSO, alternate PRSO and the Plant Safety Manager. The license requirement will be adhered to.

3. Corrective steps that will be taken to avoid further violations:
A test will be administered after each initial and refresher Radiation Safety training session and kept on file by the PRSO.

4. Date when compliance will be achieved.
Compliance began in May, 1991.

D. Violation: The licensee had no written procedures for (1) performing and documenting release surveys of equipment prior to release; (2) health physics considerations for decontamination of premises and dismantling equipment; and (3) requirements for training and retraining workers in radiation safety.

1. Reason for Violation: This violation is being contested. Documentation was provided to the inspector concerning the three aforecited radiation safety activities.

2. (1) Exhibits 6 & 7 will provide documentation of equipment release surveys. These are weekly radiation survey logs which will show the release of barrels, and AC unit (air conditioner), firebrick, etc.

(2) Health physics practices are always taken into consideration before and during a decommissioning project. Exhibits 8, 9 and 10 will show that health physics practices were, and are, ongoing.

(3) The requirements for training and retraining workers are listed in the license, Section VI, D. - Personnel Training. It states, "The PRSO provides formal radiation safety training for new permanent and temporary employees as well as contract personnel who will be performing work on the site. Refresher training covering the initial training material is given annually to employees. Supervision..."

Training was given on the following dates when new employees or contract workers were hired, or a new phase of activity was about to begin.

February 21, 1990	September 11, 1990
June 20, 1990	May 5, 1991

3. Because there is no violation, corrective steps to avoid further violations and date of full compliance is not necessary.

9-12-90

Exhibit 6

RADIATION

	PC4			ESP-1	
BACKGROUND	0.7-0.5-0.6	0.6		3.00+00-6.00+00-7.00+00	5.3
Th_{230} low (2570)	2301-2289-2293	2294			
Th_{230} high (25100)	23750-23770-23763	23761			
Am_{241} (18420)	8510-8490-8501	8500	.46		
AIR					
CHEM "C"	Down			3.6-3.3-3.5=3.47 .15=2.87 =1.68x10⁻¹³ ±.29	6
CHEM"C"EXHAUST	"				
BALL MILL	Removed				
BALL MILL EXHAUST	"				
VIB MILL	"				
VIBMILL EXHAUST	"				

WIPE		3.7	.17	.08±.33	2.21+02-1.73+02-1.44+02	[illegible]
CHEM "C"	3.9-3.6-3.6	1.53	.28	.03±.74	5.00+00-1.30+01-1.50+01	[illegible]
BALL MILL	1.1-1.7-1.8	2.43	.21	.05±.41	9.00+00-8.00+00-1.10+01	9.[illegible]
VIB MILL	2.5-2.6-2.2	3.2	.2	.07±.39	3.00+00-4.59+01-5.92+01	14
THERMITE	3.2-3.0-3.4		.52	.058±1.13	5.00+00-3.00+00-1.10+01	6.[illegible]
WAREHOUSE	2.0-2.9-2.9	2.6	.15	.2±.29	3.15+02-1.61+02-1.44+02	20[illegible]
FURNACE	8.9-9.1-9.2	9.07				

COVERALLS

6.00+00-5.00+00-8.00+00

6.45
±0.27
9.38

MISC .

57 X Barrels <100 ~~Cpm alpha~~

STACK 29.6-34.1-34.6 32.77 2.75 32.19 ~~.0001~~ 3.49

13.7-16.9-15.5 15.37 1.6 .00004 1.66

9/13 27 X Barrels <100 cpm

9/13 31.8-33.4-31.4

9/14

9/25/90

Exhibit 1

RADIATION

	PC4	ESP-1
BACKGROUND	0.3-0.6-0.6-0.5-	6.00+00-0.00+00-0.00+00 2.0
Th_{230} low (2570)	2241-2312-2337=2330 .907	2.56+03-2.63+03-2.53+03 2573.3
Th_{230} high (25101)	23852-23919-24149=23967 .955	2.40+04-2.38+04-2.39+04 23900
Am_{241} (1442)	8698-8820-8885=8807.7 .44	9.36+03-9.35+03-9.43+03 9388
AIR		1.8-1.7-1.3=1.6 .26=1.1 4.58×10^{-4} ± .51 60
CHEM "C"	Removed	
CHEM"C"EXHAUST	"	
BALL MILL	"	
BALL MILL EXHAUST	"	
VIB MILL	"	
VIBMILL EXHAUST	"	

WIPE					
CHEM "C"	1.9-1.8-1.6-1.77	.15	.037 ± .29		5.25+02-8.32+02-4.91+02
BALL MILL	2.0-2.1-1.9 2.0	.1	.042 ± .19		1.13+01-1.66+01-1.30+01
VIB MILL	8-1-0.4 .67	.23	.014 ± .22		1.00+01-9.85+00-7.00+00
THERMITE	0.8-1.2-1.0 1.0	.2	.021 ± .38		2.27+01-1.70+01-1.14+01
WAREHOUSE	1.2-1.8-1.1 1.37	.38	.029 ± .73		1.70+01-5.68+00-1.10+01
FURNACE	4.4-4.0-4.4 4.27	.23	.09 ± .45		6.64+02-4.08+01-4.36+02

COVERALLS

4.00+00- 3.00+00 -6.00-1.00

MISC

9/25 CONCRETE [redacted] SODIUM 14 cpm alpha

9/24 3 Barrels Fir[redacted]-14-7

1 Barrel asbestos 6

5 " FIREBRICK 5-14-4-7-3

POND 1N EAST SIDE 100/600 cpm

NORTH SIDE 200-600+

WEST SIDE 200-400

BOTTOM 100-500

9/26/ 1 AC UNIT OFF ROOF <100 cpm

Exhibit 8

TO: John J. Hunter

FROM: C. Simpson-Vaughn

DATE: May 22, 19?!

SUBJECT: Pond 5 Remediation Work Plan

Prior to beginning the excavation and drying of residues from Pond 5, a detailed work plan has to be drawn up, discussed and documented. The work plan will include equipment, equipment cleaning, air perimeter sampling stations, grid plan, mining plan, crew size and job description, calciner crew size and job description and safety/health physics practices.

Equipment

Dozer	Komatsu D37P
Trackhoe	Case 880
Bobcat	Clark 722
Forklift	Allis Chalmers ACP60
Forklift	Clark GPS20
Dump Truck	Chevy 7 yard
Calciner	Chem "A" Bldg.
Scrubber	Chem "A" Bldg.
Sampler	Chem "A" Bldg.

The dozer, dump truck and bobcat will be cleaned daily. The cleaning of equipment will be performed on the Chem "C" wash pad. All wash waters from the Chem "C" wash pad are directed to Pond 3 by way of a cement drainage ditch.

The trackhoe will be stationary in Pond 5 and will not need cleaning until all areas of >60 cpm have been removed. After the equipment has been cleaned, it will be checked daily by use of a hand-held Ludlum 2000 to a level of <50 cpm and a weekly wipe sample will be taken and analyzed for Alpha and Beta counts by the Canberra unit. The daily radiation checks will be logged in the Mining Log Book by the operator who has been trained to operate the survey meters. The weekly wipe sample will be logged in the Pond 5 Remediation Log Book kept in the radiation lab.

The Staplex air sampler will be placed in the area of excavation on a daily basis and a sample taken once per shift of activity. (The power to run the Staplex air sampler will come from the Weir Building.) (The air sample will be analyzed using the PC-4 Alpha counter.)

Lapel samplers will be worn daily by the pond mining/heavy equipment operator and a calciner operator and /or maintenance operator. The filters will be analyzed daily for alpha and beta counts on the Canberra counter and recorded in the Pond 5 Remediation Log Book.

Grid Plan

A grid plan for Pond 5 has been drawn, using a 20 square foot pattern. Elevations in and of the pond range from .5 feet to 4 feet. At the conclusion of the excavation of Pond 5 material, another level check will be made which will aid in approximating the amount of material removed from the pond.

Mining Plan, Crew Size & Job Description

The mining crew will consist of one operator who will operate the dozer, track hoe and dump truck. An alternate operator will be named in case of an emergency.

To begin the mining of Pond 5, we will start at the northeast corner of the berm and by using the trackhoe, scoop out the soils and place in the dump truck. The idea is to start in a "clean" area and move toward the "unclean" area. There is a 3-5' layer of calcium fluoride sludge in the pond that will be pushed toward the north side also. After removal of the CaF_2 sludge, we will begin to make surface checks using the Ludlum 2000, and taking plug samples of the soil. (There will be reference points in six foot intervals, placed on the south and east sides of the berm.) The plug samples will be analyzed for alpha and beta using the Canberra unit and recorded in the Pond 5 Remediation Log Book.

When the dump truck is full, it will go to a staging area (behind Sodium Reduction) where the material is checked for radiation levels. The Ludlum model 2000 scaller with 43-68 gas probe will be used for this operation. If the truck has a >60 cpm reading, it will deliver the material to the loading station in Chem A. From here, the material is picked up by the Bobcat and fed into Big Bertha (the calciner). As the material exits the calciner, it is collected in a hopper, the hopper is then dumped into a cooling hopper with an exit chute. After cooling (by normal room air flow) the material is dropped into bulker bags which hold up to 3500 lbs. The bulker bags are then carried by forklift to the scale, weighed, labeled and stored on the south side of Chem "A".

If the radiation level is <60 cpm, the material will be placed in the clean section of the pond to be diluted in 6" lifts with off-site soil and mixed.

The mining operator will work one shift per day (7:00 a.m. to 3:30 p.m.). This will give the operator sufficient time to load the dump truck, stock the loading station in Chem "A" and clean the equipment.

The mining operator will keep a log book of daily operations, loads of material from Pond, number of dump truck loads per day, and radiation level of material being transported to Chem "A".

Calciner Crew Size & Job Description

The calciner crew will consist of two operators (one operator and one operator/maintenance person) per shift plus a supervisor. The calciner crew will be dedicated to the Pond 5 project only. There will be no rotation of employees. There will be an alternate operator assigned in case of an emergency.

The calciner crew will operate and load Big Bertha, transfer dried material to the cooling hopper, bag the material, weigh, label and store the bags in Chem "A". The shift supervisor will keep a log book of daily operations, dry weight, amount calcined, radiation safety checks, etc.

Safety & Health Physics

Personal Equipment - Each operator shall wear the following:

1. Hard hat
2. Safety glasses
3. Tyvex coveralls/washable coveralls
4. Safety boots/shoes
5. Gloves
6. Film badge
7. Radiation dust mask (purple tip) #3M-type 9970L
8. Lapel air sampler (1 operator/week)
9. Face shield when handling liquids

At the end of the shift, the operator must shower and leave all plant equipment and clothing on site. There will be a dedicated disposal can for dust masks, gloves and tyvex coveralls in the wash area. All disposables must be placed in the three cans labeled "Gloves", Tyvex" and "Dust Masks". At the end of the week, all disposals will be incinerated.

Bioassay

A bioassay will be performed on each operator and supervisor at the initiation of the project and once a month thereafter. The Radiation Safety Officer shall also comply with this requirement.

Before an employee working on the Pond 5 project can go home, he must be checked by the supervisor or Radiation Safety Officer using the Ludlum 2000 counter. This will include a scan of the hands and body and bottom of the shoe surface. A reading of >30 cpm will require further cleaning. The shift supervisor will record this reading in the shift log book daily.

Other

Any standing water or liquid in Pond 5 will be pumped .. the rain water catch tank, which is pumped to the waste water treatment plant.

The calcinber scrubber make-up/diluted wat(: will be replaced once a week. The water from the tank will be pumped to Pond 3.

The stack sampler will be monitored every 3 hours. The filter disks will be analyzed by the radiation officer using the PC4 alpha counter.

Exhibit 4

POND 1 REMEDIAL ACTION

Remedial activity concerning pond 1 commenced in September,1990. Prior to this project there were two separate ponds designated 1 North (1N) and 1 South (1S). Diagram 1 shows the original plot plan at the time of this remediation project.

At the time of this remediation project, pond 1N contained solid materials consisting largely of calcium flouride and calcium sulfate, while 1S contained run off water from various plant locations. The ponds were sampled and analyzed for both pH and radioactivity (gross alpha and beta). The laboratory results showed no elevated radioactivity or concerning pH levels. The water from 1S was disposed of through the Fansteel's wastewater treatment plant, and a solid sample from 1N was sent to BFI's landfill for testing. Upon BFI's approval, approximately 1170 tons of material was disposed of at their solid waste disposal facility.

The liners from both ponds were cleaned thoroughly using high pressure water and removed. After removal, the underside of the liners were also washed using the same method. Radiological testing for gross alpha and beta was performed in the laboratory before the liners were cleared to be cut up and sent to an off site disposal facility.

Upon removal of the liners, it appeared that they had been placed over what had previously been a containment area for process residues. Due to the high levels of radioactivity, the entire area was excavated until clean (non radioactive) soil was found, the nominal depth was approximately 12 feet. As with all excavated soil removed during this project, if the radioactivity was above 100 cpm the soil was transfered to Pond 3, if below 100 cpm the soil was stockpiled inside the contaminated area. Radioactivity measurements in the work area were taken using a Victoreen Inc. radiation survey meter (model 290 w/489-110C).

After this initial excavation, it was apparent that the contamination area was larger than the original Pond 1 area. To better determine the extent of the contamination, 8 borings were drilled and several test pits were dug. Findings from this exploration prompted Fansteel to remove 2 large ammonia storage tanks and their concrete foundations in which the contamination was determined to be under. After removal, the entire area was excavated down to clean, non radioactive, soil. Apendix I shows laboratory results of various samples taken during excavation. The same 100 cpm limit as mentioned above was used to determine the destination of the excavated soil.

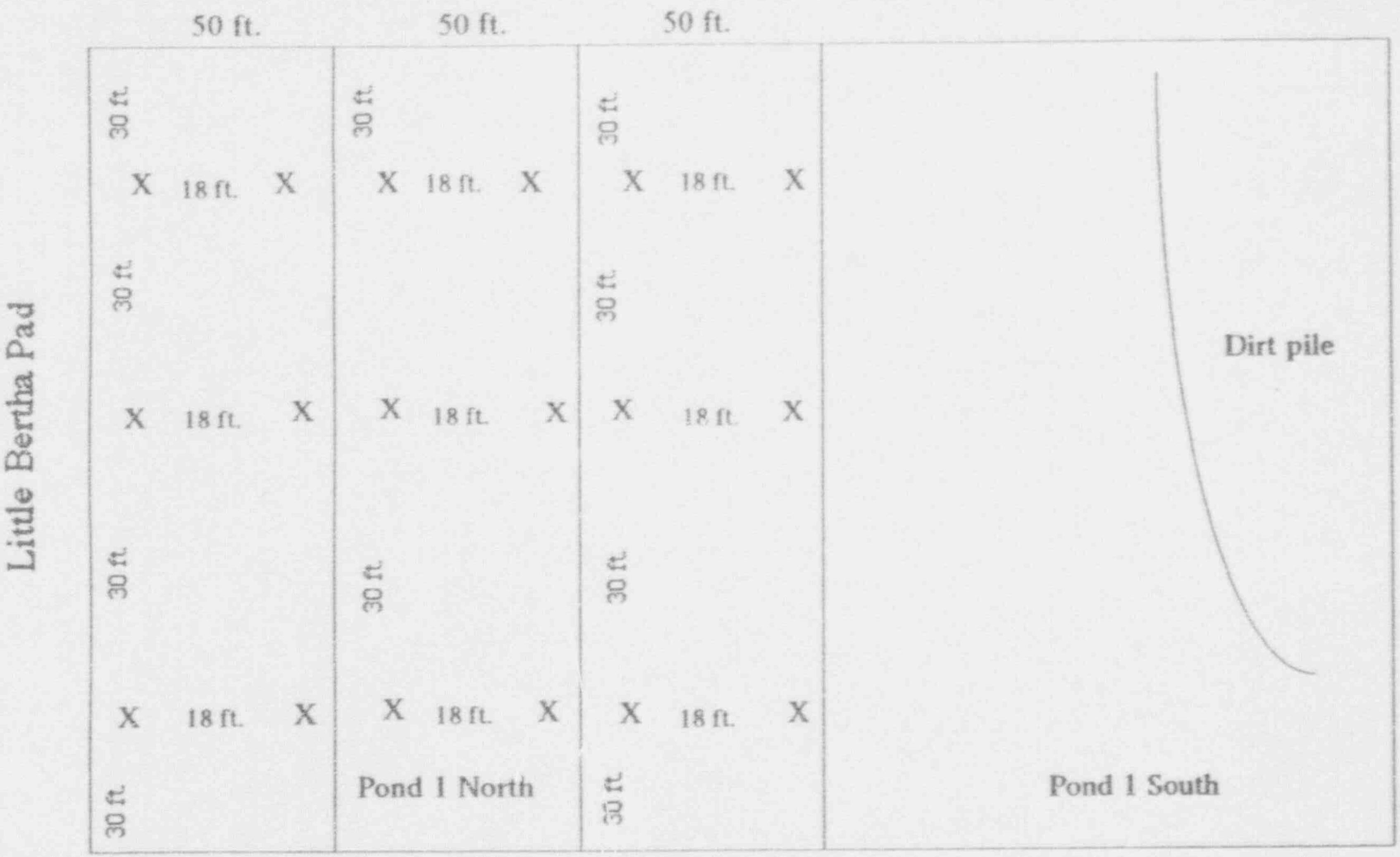
Concrete removed during this excavation was cleaned using high pressure water until laboratory analysis confirmed that radioactivity levels were sufficiently reduced to background levels.

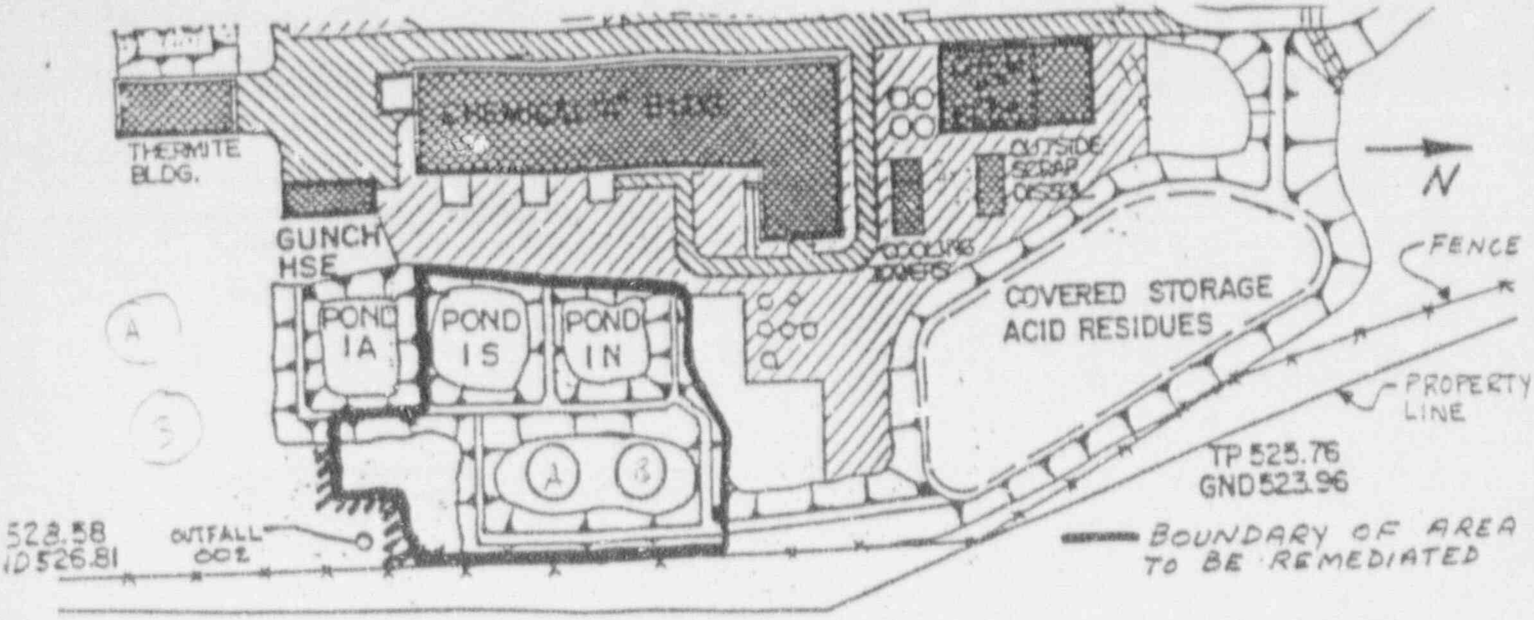
The large hole generated by the excavation process was then filled using a mixture of clean fill dirt from off site and the excavated soil stockpiled in the immediate area (<100 cpm). Clean fill and the stockpiled material was then mixed, tilled, and compacted in about six inch lifts. After each lift, composite samples were gathered using a predetermined grid (6 samples per 50 ft. sections, see Grid Diagram) and analyzed for gross alpha and beta radioactivity to determine whether or not more clean fill was needed. Laboratory results of all radioactivity analysis can be found listed in Table 1, with the actual result slips located in Appendix II. After laboratory approval, the next lift was performed until the entire site was brought back to grade and all stockpiled material had been used. Approximately 16,465 tons of dirt was needed to bring the site back to grade and sufficiently reduce the radioactivity levels of the area. Also, the area to the south of excavation was smoothed in order to match the final contours of the remediation site to the natural elevations, see Diagram 1. Finally, to complete the project, a layer of top soil (4-6 inches) was spread and the area was revegetated. This project was completed the end of April, 1991.

All workers on this project wore protective clothing (coveralls), hard hats, gloves and safety goggles. In addition, dust masks rated for radionuclides, 3M-type 9970L, were worn. All earth moving equipment was cleaned at the decontamination area in front of the Chem C building with high pressure water and checked for alpha using the Victoreen survey meter (model 290 w/489-110C).

Carole S. Vaughn

POND 1 NORTH / SOUTH SAMPLE LOCATIONS





OCTOBER 17, 1990

REMEDIATION STEPS 1N - 1S:

1. REMOVE ALL SOIL TO S BOUNDARY AT AREA TO BE REMEDIATED AND STACK. REMOVE SOIL DOWN TO HARD PAN.

2. SAMPLE HARD PAN FOR LLR, pH, CHEM. CONTENT. USE COMPOSITE SAMPLES UNLESS DEFINITIVE VEINS ARE EXPOSED. IF VEINS ARE PRESENT, SAMPLE BEFORE PROCEEDING. IF ALL SAMPLING SHOWS AREA TO BE WITHIN SPEC. PROCEED; IF NOT, SCRAPE AREA DOWNWARD UNTIL ALL SAMPLING SHOWS AREA TO BE WITHIN SPEC.

3. SPREAD 6-9" OF KNOWN, NON ACTIVE SOIL OVER EXPOSED AREA.

4. SPREAD 1 FT. OF STACKED MATERIAL OVER NON ACTIVE SOIL.

5. TILL LAYERS UNTIL THOROUGHLY MIXED.

6. COMPOSITE SAMPLE AREA FOR LLR, pH, CHEM. CONTENT.

7. ADJUST SOIL TO BE WITH IN ALL SPEC. BEFORE PROCEEDING.

8. WALK MIXED SOIL DOWN WITH DOZERS TO COMPACT.

9. REPEAT STEPS 3-8 FOR EACH SUCCESSIVE LIFT UNTIL DESIRED GRADE IS REACHED.

10. GRADE SO THAT RUNOFF FLOWS W TO E AND N TO S, BUT IS CONTAINED WITHIN BOUNDARIES. RUNOFF WILL BE LET OUT THROUGH OUTFALL 002.

JJH/bb

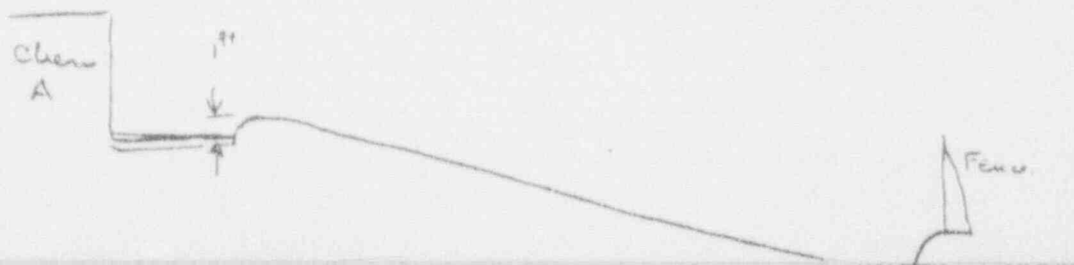


Exhibit 10

Inter-Office Correspondence **Fansteel**

To J. Hunter

From C. Vaughn

Date August 25, 1990

Subject Chem C Clean-up & Equipment Removal Plan

Chem C is divided into 2 sections, North - Digestion and South - Liquid/Liquid Extraction. After vacuuming, we will begin the equipment removal from the north section, 1st or ground level. As we remove equipment, etc., from the upper levels, I would like to "rope off" the areas where the floor grating no longer exists, for safety reasons. All workers in the Chem C building must wear protective clothing (coveralls and/or tyvex coveralls), hard hats, safety glasses, gloves and dust masks rated for radionuclides. I also plan to label the large items with a removal sequence number to maintain some order to the project.

CHEM C NORTH - REMOVAL SEQUENCE

<u>1st level</u>

1. Cut power off
2. Slag & ore conveyor
3. Floor scales
4. Scale weigh-out equipment (room east of the back door)
5. Scrubber exhaust/dust collector

<u>2nd Level</u>

1. All lines - chemical, steam, electric, air & small water
2. Desk
3. Extraction tanks - 8
4. Feed tanks - 3
5. Holding tanks - 2
6. Scrubber exhaust

3rd Level
1. Digesters - 6
2. Feed tanks - 2
3. Condensers - 2
4. Water measuring tank -1
   a. water meter
   b. HF indicator meter
5. All braces
6. Crane - 1
7. Storage tanks -4

There is equipment stored outside on the south side of the building. All of this equipment is from the digestion process. This equipment needs to be cleaned and stored with the equipment from Chem C north.

1. Braces/stands
2. Feeders - screw
3. Motors
4. Condensers
5. Hoppers
6. Mud tank

CHEM C SOUTH - REMOVAL SEQUENCE

Level 1
1. Cut power off
2. Unhook lines to tanks
3. Remove exhaust lines
4. Tantalum tanks - (north wall)
5. Ketone, ABF, Cb tanks - 7 (middle)
6. Sulfuric acid system - (north wall)
7. Cb & Ta reservoir tanks - 3 (north wall -1, south wall - 2)
8. Cb tanks - 3 (middle)
9. 15N sulfuric make-up tank - 1 (middle-south)

Level 2
1. Remove all lines
2. All head boxes - 11
3. Desk
4. Extraction boxes - 13 north, 5-south - total - 18
5. Storage tanks - 9
6. Sulfuric acid measuring tank - 1
7. Cranes - 2

OUTSIDE BEHIND CHEM C

1. Scrap dissolving
   a. Tanks - 6 material to pond 3
   b. Catch tank - 1 material to pond 3
2. Scrubber system
3. Electrical room - Vanton pumps (rebuilt) - 3
4. Ditch lines from chem C to WWT
5. Barrel washer sump - material to pond 3
6. Conveyor Pit - (slag & ore dumping) - material to pond 3
7. Sump pit - (north) - material to pond 3
8. Sump pit (inside Chem C north, adjacent to outside sump pit) - pond 3

The following items need immediate attention before we get started with the removal.

1. Catch tank - rusted - Yaffee
2. Hopper - rusted - Yaffee
3. Dumpster - rusted - Yaffee
4. Empty barrels - crush and send to Yaffee (there is a working barrel crusher in place)
5. New plastic tank - remove to pad storage

The ball mill equipment needs to be arranged and stored in one area of the ore pad before we start Chem C removal.

Contact Ted to release ALL equipment before it is moved. All cleaned equipment removed from Chem C will be stored on the ore pad, in the middle section. A designated area will be marked off.

Steps taken to ensure management control of safety measures during the remediation phase of the Muskogee Plant:

1. A manager was named to coordinate remedial activities - June 1990.

2. A Radiation Safety Committee was put in place - July 1990.

3. An alternate PRSO was formally trained - September 1990.

4. Project work is reviewed prior to commencement. If warranted, a formal operations/safety plan is derived and implementation is then carried out under plan direction. Records are kept of project progress and completion and compliance with safety measures.

5. A consulting firm has been brought forward to aid/assist in project implementation safety concerns. The consulting firm has a health physicist who has been used on several occasions to present plant safety concerns and counter-measures.

6. Safety concerns, whether mechanical, electrical, operational, chemical or radiological are discussed daily as they pertain to each day's activities. Brief notes are kept of these discussions.

7. A review of license conditions and the Radiation Safety Manual is being made to upgrade them to current conditions.

8. Familiarity with license conditions is being upgraded daily. This familiarity, along with a pro-active attitude toward safety and the remedial process, will be the first line of defense to prevent future violations of permit conditions.