Texas Department of Health

William R. Archer III, M.D.
Commissioner

1100 West 49th Street
Austin, Texas 78756-3189
(512) 458-7111

Radiation Control
(512) 834-6688

Patti J. Patterson, M.D., M.P.H.
Executive Deputy Commissioner

99 JAN 27 PM 6:01

OSP

January 20, 1999

United States Nuclear Regulatory Commission
ATTN: Paul Lohaus, Deputy Director
Office of State Programs
Mail Stop O3H20
Washington, D.C. 20555

Dear Mr. Lohaus:

The Texas Department of Health (TDH) has received a request from USX Corporation (USX), Texas Uranium Operations, dated December 8, 1997 (Enclosure 1), pertaining to the 28.2 acre Pawlik Production Area on Radioactive Material License No. L02449. The Licensee is requesting that the area be removed from the license.

The license authorized in situ leach mining in the area. This area was operated from 1977 to 1987, when production operations were ceased and reclamation efforts were commenced.

From 1987 until 1996 groundwater restoration was performed along with limited surface reclamation. The Texas Natural Resource Conservation Commission authorized ceasing groundwater restoration and final plugging of all wells in July 1996 (Enclosure 2). Following plugging of all wells, full scale surface reclamation and decommissioning began.

During surface reclamation and decommissioning all material and equipment was surveyed for radioactive contamination. Any material and/or equipment which was contaminated was disposed of by utilizing one of the following methods:

transfer to another licensed mine site;
decontamination and release for unrestricted use; or
disposal at a licensed byproduct disposal facility.

Proper disposal of all material and/or equipment was documented by the licensee.

Direct surveys, by the licensee, to confirm the effectiveness of reclamation and decommissioning activities of land were performed by defining ten meter by ten meter squares in a grid pattern across the production area and taking five readings in each square with a micro-R meter. The licensee subsequently requested removal of the production area from its license.

Reclamation and decommissioning activities were completed at the site in 1997.

In December, 1997, TDH personnel performed a confirmation survey of the production area. The surveys were performed using one-by-one sodium iodide probes and Ludlum 14C survey meters. The purpose of the survey was to allow the Licensee to release the production area for unrestricted use. Two times background was used as an allowable limit (TDH Regulatory Guide 5.10, Guidelines for Conducting Close Out Surveys of Open Lands and Requesting Release for Unrestricted Use). The survey was performed by walking 10 meters apart moving across the production area. Background readings were 1500 cpm, 2000 cpm, and 2400 cpm on the three instruments used.

Sixteen areas were identified which exceeded two times background. These areas were cleaned up by the Licensee and resurveyed by TDH personnel. Two areas still exceeded two times background after the cleanup. After the Licensee had completed their cleanup, soil samples were retrieved from five areas by TDH personnel, including the two which exceeded two times background (TDH Regulatory Guide 5.10, Guidelines for Conducting Close Out Surveys of Open Lands and Requesting Release for Unrestricted Use). Soil sample results were within the regulatory limits for radium-226 and natural uranium soil concentrations of 5 pCi/gm and 30 pCi/gm, respectively, except for two soil samples which exceeded these limits.

In April, 1998, TDH personnel returned to the Pawlik Production Area to survey and take soil samples after the Licensee had cleaned the areas that had exceeded release limits. Soil sample results were within the regulatory limits for radium-226 and natural uranium soil concentrations of 5 pCi/gm and 30 pCi/gm, respectively.

On-site disposal of solid radioactive material or byproduct material was not authorized at this facility. Thus, there is no land to be transferred to the State of Texas or the Federal Government.

As a result of these findings, we are proposing to remove the Pawlik Production Area from this license (Enclosure 3). All data supporting our proposal are kept on file and is available at TDH should it be necessary for reference at a future date. Please advise if the U.S. Nuclear Regulatory Commission wishes additional material or information in order to make a determination regarding concurrence with our proposal that the production area be removed from this license. If additional information is required, please contact Mr. Eugene Forrer of my staff at (512) 834-6688, ext. 2208.

This letter is a resubmittal of a request sent in September of 1998.

As maintaining this site places an undue economic burden and hardship on the licensee, we request expeditious processing of this request.

Sincerely,

Richard A. Ratliff, P.E., Chief
Bureau of Radiation Control

Enclosures

Enclosure 1

RF 3C HW 01

MEMORANDUM

RW 2449

DATE: December 8, 1997

TO: Brad Caskey

FROM: Chuck Wentz

RE: Areas ready to be surveyed

As per our conversation on Friday, I am providing the following list of areas ready to be surveyed by the TDH.

1. Pawlik pattern area. About 28.2 acres were surveyed by TUO personnel. This includes a 30 meter "boarder", the actual pattern area is about 22 acres. A survey map is attached for you to review. All of the mine aquifer wells have been plugged and abandoned.

2. The Burns Ranch (WDW 130) holding pond. This is a 400 ft X 400 ft pond. A drawing of the pond is attached.

3. Three Dalco pits. Total area is about 1.5 acres. The individual dimensions are: Pit No. 1, 110 ft X 245 ft; Pit No. 2, 170 ft X 140 ft, and Pit No. 3, 120 ft X 120 ft.

4. Two septic tank systems. Sketches are attached. One system has about 240 ft of small trenches, the other system has about 40 ft of trenches.

5. Two trench areas that were surveyed by the TDH last week and had to be remediated. Approximate combined area is about 140 square feet.

C. Wentz

USX Corporation
Texas Uranium Operations
Drawer V
George West, TX 78022
512 566 2441

September 22, 1998

USX

Mr. Gene Forrer, Chief
Uranium Licensing Project
Texas Department of Health
1100 W 49th Street
Austin, Texas 78756-3199

Re: Pawlik Wellfield Close-out Surveys
and Analytical Results
Radioactive Material License No. L02449
TNRCC Permit No. UR02368 PAA 011

Dear Mr. Forrer:

USX/Texas Uranium Operations (TUO) provides the following information for the Pawlik wellfield micro(μ)R/Hr surveys and soil analyses.

PATTERN AREA

The preliminary μR/Hr soil surveys were conducted from June 16, 1996 to July 5, 1996. The pattern area was marked in 10 meter grids with a 30 meter perimeter area surrounding the actual patterns. The grids were surveyed using Ludlum Model 19 micro R meters such that at least five readings were recorded within each 100 sq. meter grid. Areas that had readings above twice background were flagged and delineated for the extent of contamination.

Contaminated material from the initial survey was shipped to Rio Grande Resources' waste site at Panna Maria, Texas. Follow-up surveys were conducted in the summer of 1997 prior to a request to have the TDH perform a confirmation survey of the pattern area in a memo to Mr. Brad Caskey on December 8, 1997.

The confirmation survey was completed during the third week of December 1997. Sixteen areas showed readings more than twice background. Ten of these areas were small enough to be remediated during the confirmation survey. The μR/Hr readings for five areas remained questionable. The TDH and TUO split samples at these five locations and took one sample from an area designated as a background reading. The results of the split sampling and other soil samples taken by TUO personnel are shown in Table 1. Also attached with this report is a map showing the final μR/Hr survey readings.

PAWLIK PIPELINES

Two sixteen inch pipelines were used to transfer production solution and barren solution between the Pawlik pattern area and Satellite IV at the Boots/Brown mine. Survey data taken along the transfer pipelines are shown in Tables 2 and 3.

SPILL REVIEW

Review of the spill files showed that seven spills had been reported since 1981. These spills are listed in Table 5. Most of the spills were within the pattern area. Three of the spills were along the Pawlik pipelines discussed in the previous section. Survey data and soil samples taken from the spill area adjacent to the pipeline are shown in Table 4.

SUMMARY

Maps included with this report are a Permit location map and pattern area survey map. Tables included are pattern soil samples, pipeline surveys, spill surveys and soil samples, and a list of the spills.

The surface area of Permit 02368 PAA 011 has been remediated and documented. TUO is requesting that the surface area at the Pawlik mine be released for unrestricted use.

If you have any questions or need additional information please call me at 512-449-2515 or fax at 512-566-2442.

Sincerely,

Charles N. Wentz

Manager - Operations

Enclosure 2

7April 1998

DPB

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

April 2, 1998

Mr. Douglas Boyea, Manager-Environmental Affairs
USX Corporation
Drawer V
George West, TX 78022

Re: Voluntary Revocation of Permit UR02368, Pawlik Mine

Dear Mr. Boyea:

In accordance with 30 TAC §305.67(b), the Texas Natural Resource Conservation Commission revokes permit UR02368.

Groundwater was restored following criteria set forth in 30 TAC 331.107. An amendment to Production Area Authorization No. 1, modifying restoration table values in accordance with 30 TAC 331.107(f)(2) was signed by the Executive Director on June 21, 1996. All of the Class III wells were plugged as of October 1996, and certifications have been received from the mine operator and from an independent registered professional engineer that plugging was accomplished in accordance with the plugging and abandonment plan in the permit. This letter serves as notification that Permit UR02368 is no longer in effect.

If you have any questions, please contact Mr. John Santos at 512/239-1030, mail code MC131.

Sincerely,

Alice Hamilton Rogers, P.E., Manager
Underground Injection Control and Radioactive Waste Section
Industrial and Hazardous Waste Division

AHR/JJS/jb

cc: Mr. Ray Leissner, EPA Region 6, 6WQ-S
Mr. Richard Ratliff, TDH

I:\URW\SANTOS\USX\2368\2368-CLO.SE

Received
18 July 1996
DOBoyea

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

July 11, 1996

Doug Boyea
USX Corporation
Drawer V
George West, TX 78022

Re: Restoration Determination of Pawlik Mine, Permit No. UR02368-011

Dear Mr. Boyea:

The Texas Natural Resource Conservation Commission has received the restoration data for Production Area 1 of the Pawlik Mine. A review of the data shows that the production area has been restored in accordance with the specifications contained in permit UR02368 and as required by 30 TAC §331.107. You are now authorized to cease any restoration activities, including monitoring, at this production area.

Within 120 days of receipt of this letter, closure of the wellfield shall be accomplished following the approved plugging and abandonment plans for this site. If necessary, additional time may be granted for plugging the wells provided that the Commission is notified in advance. The Commission must approve any changes to the plugging procedures or the plugging schedule.

Please notify the Commission before commencing plugging activities to provide the opportunity for TNRCC personnel to be present. If you have any questions, please contact me at 512/239-6633 or John Santos of the UIC Permitting Team at 512/239-1030, or send correspondence to Mail Code MC-131.

Sincerely,

Ben Knape

Ben Knape
UIC Permitting Team Leader
UIC, Uranium, and Radioactive Waste Section
Industrial and Hazardous Waste Division

BK/JJS

cc: John Santos

Texas
Natural Resource
Conservation Commission

Austin, Texas

PRODUCTION AREA AUTHORIZATION

Mine: Pawlik
Production Area UR02368-011

This Production Area Authorization supersedes and replaces Permit No. UR0 2368-011 issued October 27, 1987

AUTHORIZATION to conduct underground injection under provisions of Permit No. UR02368

I. Name of Permittee:

A. Name: USX Corporation

B. Address: Drawer V
George West, TX 78022

II. Name of Mine: Pawlik

III. Standard Provisions:

A. Restoration Table

B. Control Parameter Upper Limits Table

C. Designated Monitor Well Table

D. Permit Area Map

CONTINUED on Pages 2 through 10

The permittee is authorized to conduct injection activity in accordance with limitations, requirements, and other conditions set forth herein. This Authorization is granted subject to the provisions of Permit No. UR02368. This Authorization is valid until amended or revoked by the Commission.

DATE ISSUED: JUN 21 1996

ATTEST: Gloria A. Vasquez

For the Commission

E. Mining and Restoration Schedule

F. Plan View of Mine Area

G. Baseline Water Quality Table

ATTACHMENT A

RESTORATION TABLE
(Amended)

Parameter	Unit	Concentration	
		"A" zone	"B" zone
Calcium	mg/l	225.	51
Magnesium	mg/l	50.	11.
Sodium	mg/l	750.	290.
Potassium	mg/l	32.	16.
Bicarbonate	mg/l	325.	321.
Sulfate	mg/l	275.	20.
Chloride	mg/l	1405.	386.
Fluoride	mg/l	0.9	1.08
Nitrate-N	mg/l	0.05	0.03
Silica	mg/l	39.	37.
pH	std. units	6.0-9.0	6.0 - 9.0
TDS	mg/l	2607.	1002
Conductivity	µmhos	4566.	1748
Alkalinity	std. units	290.	263
Arsenic	mg/l	0.0030	0.001
Cadmium	mg/l	0.0002	0.0001
Iron	mg/l	.27	0.29
Lead	mg/l	0.002	0.001
Manganese	mg/l	0.09	0.037
Mercury	mg/l	0.0001	0.0001
Molybdenum	mg/l	0.07	0.01
Selenium	mg/l	0.001	0.001
Uranium	mg/l	0.02	0.002
Radium 226	pC/l	92.5	22.7
Ammonia	mg/l	0.2	0.11

USX Corporation
Production Area Authorization #1
UR02368-011

ATTACHMENT B

CONTROL PARAMETER UPPER LIMITS TABLE

Control Parameter	Production Zone
	A and B Zone
Ammonia, mg/l	5.31
Conductivity, µmhos	5350.
Sulfate, mg/l	187.
Uranium, mg/l	5.00

	Non-Production Zone		
Control Parameter	C Zone	D Zone	Goliad
Ammonia, mg/l	5.08	5.15	5.04
Conductivity, µmhos	2438	2538	4375
Sulfate, mg/l	185.	185	578
Uranium, mg/l	5.00	5.00	5.01

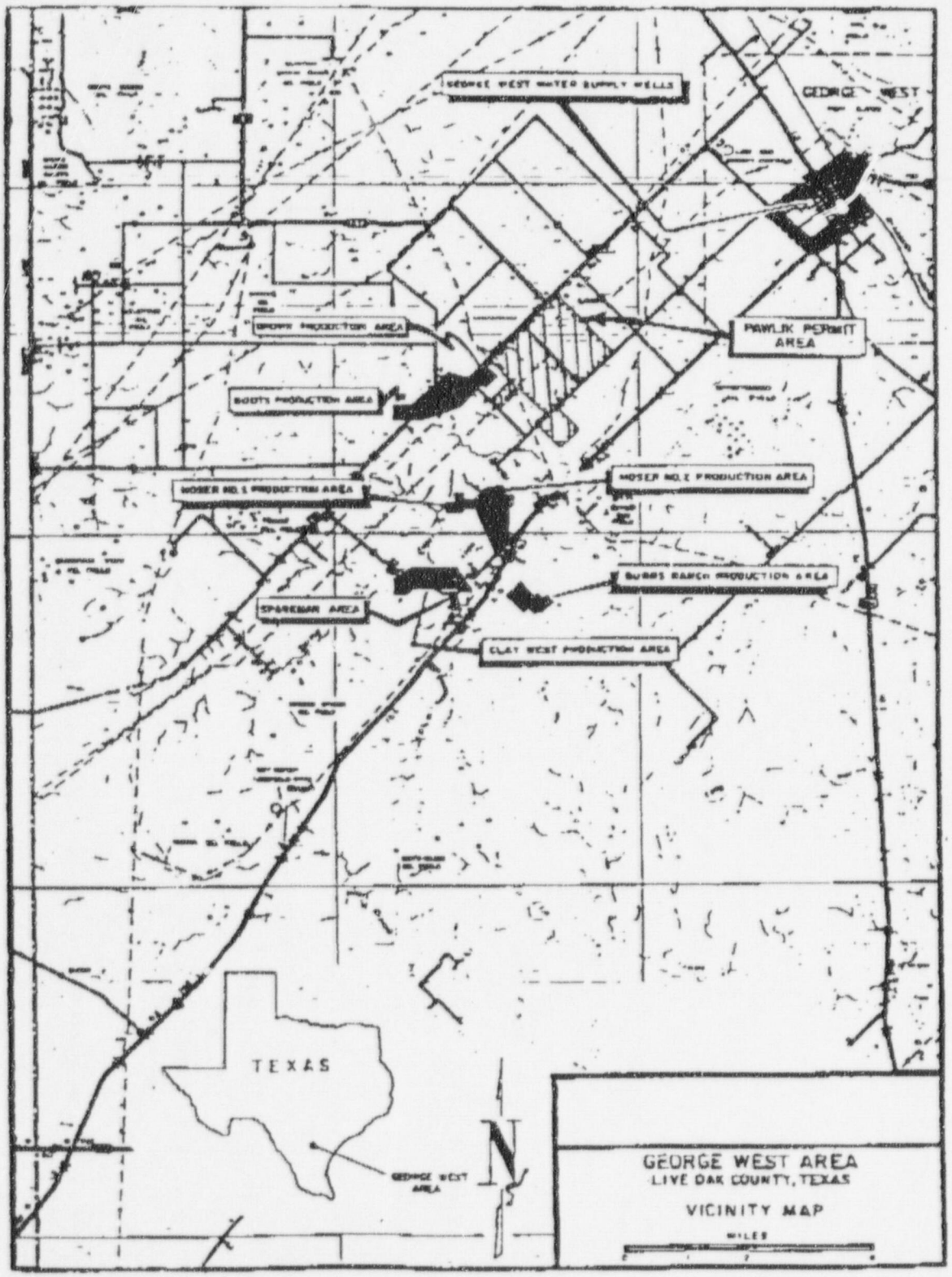
ATTACHMENT C

DESIGNATED MONITOR WELL TABLE

Production Zone	Non Production Zone
501 MD	First Overlying Aquifer
502 MD	
503 MD	526 MS
504 MD	527 MS
505 MD	528 MS
506 MD	529MS
507 MD	530MS
508 MD	532MS
509 MD	OW-16
510 MD	
511 MD	Second Overlying Aquifer
OW-4	
538 MD	519MD
537 MD	520MD
	521MD
	522MD
	523MD
	524MD
	525MD
	Second Overlying Aquifer
	534MS
	535MS
	536MS
	OW-17

ATTACHMENT D

PERMIT AREA MAP



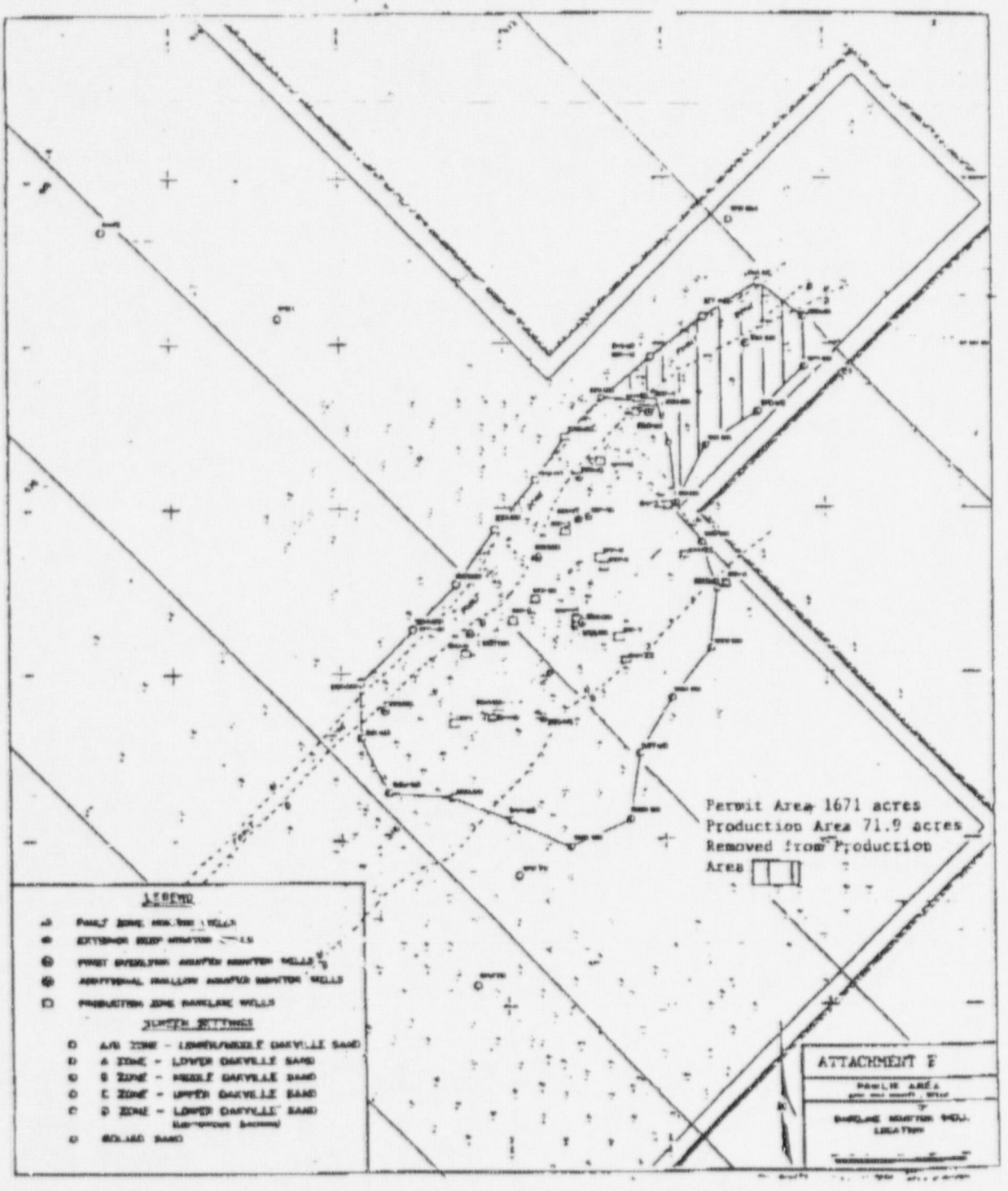
ATTACHMENT E

MINING AND RESTORATION SCHEDULE

Mining Phase		Restoration Phase	
Start	End	Start	End
August 1980	June 1984	August 1982	June 1995

ATTACHMENT F

PLAN VIEW OF MINE AREA



USX Corporation
Production Area Authorization #1
UR02368-011

ATTACHMENT G

BASELINE WATER QUALITY TABLE

ATTACHMENT G

BASELINE WATER QUALITY TABLE – In Situ Uranium Mining

Operator: [illegible]
Mine Name: Pawlik
Mine Area: UR368-011
Date Summarized: 4/2/80 – 4/3/80

	PARAMETER	UNIT	PRODUCTION ZONE – A Zone Prod. Area Wells(8) Low	Average	High	B Zone Prod. Area Wells(9) Low	Average	High	A-B Zone Mine Area Wells(16) Low	Average	High	WELL I.D. BY AREA: NON-PROD. ZONE	PROD. ZONE Mine	Prod.
1	Calcium	mg/l	91	144	197	24	51	75	28	87	172			
2	Magnesium	mg/l	20	29	43	6	11	16	6.1	18	36		A-B	A ZONE
3	Sodium	mg/l	568	750	914	190	290	360	275	474	843		ZONE	
4	Potassium	mg/l	27	32	41	11	16	26	15	25	40		SOIMD	DW-1
5	Carbonate	mg/l	0	0	0	0	0	0	0	0	0		Tierra	DW-1
6	Bicarbonate	mg/l	135	197	251	275	327	381	70	250	322		SISMD	DW-1
7	Sulfate	mg/l	4	14	24	6	20	32	9	17	37		SISMD	DW-1
8	Chloride	mg/l	1108	1405	1701	120	308	571	330	804	1570			A ZONE
9	Fluoride	mg/l	0.59	0.795	0.85	0.92	1.0	1.24	0.61	0.93	1.17			
10	Nitrate - N	mg/l	<0.01	0.045	0.18	<0.01	0.03	0.17	<0.01	0.02	0.09			DW-9
11	Silica	mg/l	36	39.2	44	31	37	45	26	37	48			DW-11
12														DW-12
13	pH	Std. unit	7.21	7.66	8.05	6.92	7.69	7.89	6.72	7.40	7.91			DW-10
14	TDS	mg/l	2030	2607	3180	603	1022	1320	930	1657	3020			Tierra
15	Conductivity	µmhos	3570	4566	5680	1060	1748	2260	1550	2941	5290			DW-2
16	Alkalinity	Std. Unit	111	162	206	225	263	312	97	205	264			
17														
18	Arsenic	mg/l	<0.001	0.003	0.020	<0.001	<0.001	0.001	<0.001	<0.001	0.001			
19	Barium	mg/l	1.2	1.47	2.4	0.21	0.40	0.60	0.14	0.95	1.7			
20	Boron	mg/l	0.97	1.43	2.1	0.67	0.93	1.2	0.69	1.15	2.1			
21	Cadmium	mg/l	0.0001	0.0002	0.0005	0.0001	0.0001	0.0001	<0.0001	0.0003	0.0004			
22	Chromium	mg/l	0.002	0.004	0.006	0.001	0.006	0.020	<0.001	0.003	0.007			
23	Copper	mg/l	0.001	0.0004	0.027	<0.001	0.004	0.007	0.002	0.005	0.008			
24	Iron	mg/l	0.05	0.27	1.6	0.02	0.29	0.87	0.02	0.08	0.15			
25	Lead	mg/l	<0.001	<0.001	0.001	0.001	0.001	0.001	<0.001	<0.001	0.001			
26	Manganese	mg/l	0.012	0.028	0.057	0.013	0.037	0.088	0.005	0.025	0.175			
27	Mercury	mg/l	0.0001	<0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002			
28	Nickel	mg/l	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
29	Selenium	mg/l	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001			
30	Silver	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
31	Zinc	mg/l	0.007	0.038	0.123	0.003	0.012	0.022	0.004	0.017	0.050			
32														
33	Ammonia	mg/l	0.04	0.20	0.31	0.01	0.11	0.26	0.04	0.13	0.23			
34	Uranium	mg/l	[illegible]	0.002	0.007	<0.001	0.002	<0.001	<0.001	0.001	0.003			
35	Molybdenum	mg/l	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01			
36	Vanadium	mg/l	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01			
37	Radium 226	pCi/l	4.4	92.5	340	1.8	22.7	119	1.3	17.4	121			

ATTACHMENT G (con't)
BASELINE WATER QUALITY TABLE

ATTACHMENT G (CONTINUED)

GROUND WATER ANALYSIS REPORT SUMMARY

BASELINE WATER QUALITY TABLE – In Situ Uranium Mining

Mine Name: Pay
Mine Area: 023
Date Summarized: 4/27/1980 - 4/31/1980

	PARAMETER	UNIT		NON-PRODUCTION ZONE: Collad Non-Prod. Wells (4) Low	Average	High	C Zone Non-Prod. Wells (9) Low	Average	High	FAULT ZONE: D Zone Fault Wells (10 Low	Average	High	WELLS BY AREA: NON PROD. ZONE	FAULT ZONE	
1	Calcium	mg/l		182	198	228	27	50	75	34	54	131			
2	Magnesium	mg/l		33	35.7	38	5.5	11.2	16	1.5	11.3	31	Collad		D ZONE
3	Sodium	mg/l		201	207.7	216	191	249	289	270	291.9	318	Zone		516MD
4	Potassium	mg/l		16	17.7	20	14	14.9	19	13	14.2	16	534MS		THRU
5	Carbonate	mg/l		0	0	0	0	0	0	0	0	0	535MS		525I
6	Bicarbonate	mg/l		132	215	270	261	350	421	276	317	360	536MS		
7	sulfate	mg/l		124	126	128	3	19	35	2	15.8	35	DW-17		
8	Chloride	mg/l		551	582	624	128	302	497	289	360	481			
9	Fluoride	mg/l		0.65	0.715	0.75	0.88	1.05	1.21	0.82	1.13	1.24	C Zone		
10	Nitrogen - N	mg/l		<0.01	0.182	0.55	<0.01	<0.01	0.02	<0.01	0.029	1.35	526MS		
11	Silica	mg/l		33	35	39	29	38	45	36	42	48	thru		
12													523MS		
13	pH	Std unit		7.12	7.53	7.80	7.40	7.58	771	7.14	7.50	7.91	DW-16		
14	TDS	mg/l		1300	1385	1510	664	899	1210	831	970	1140			
15	Conductivity	µmhos		2210	2301	3500	1070	1499	1950	1470	1655	2030			
16	Alk phenlp	Std Unit		108	176	221	214	287	345	226	260	295			
17															
18	Arsenic	mg/l		<0.001	0.0015	0.002	<0.001	<0.001	0.001	<0.001	0.001	0.018			
19	Barium	mg/l		0.06	0.085	0.10	0.22	0.42	0.61	0.025	0.38	1.1			
20	Boron	mg/l		0.61	0.66	0.69	0.61	0.87	1.0	0.50	0.77	1.0			
21	Cadmium	mg/l		<0.000	0.0001	0.0002	<0.000	0.0001	0.0003	0.0001	0.0001	0.0001			
22	Chromium	mg/l		0.004	0.006	0.011	0.002	0.005	0.013	<0.001	<0.001	0.002			
23	Copper	mg/l		0.003	0.005	0.006	0.003	0.006	0.016	0.002	0.006	0.012			
24	Iron	mg/l		0.11	0.37	0.68	0.05	0.32	0.61	0.02	0.08	0.20			
25	Lead	mg/l		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002			
26	Manganese	mg/l		0.083	0.115	0.150	0.018	0.063	0.192	0.005	0.011	0.017			
27	Mercury	mg/l		<0.0001	0.0001	<0.0001	<0.0001	0.0001	0.0002	<0.0001	<0.0001	0.0002			
28	Nickel	mg/l		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
29	Selenium	mg/l		<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
30	Silver	mg/l		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02			
31	Zinc	mg/l		0.004	0.007	0.011	0.004	0.061	0.265	0.006	0.021	0.050			
32															
33	Ammonia	mg/l		<0.01	0.01	0.04	0.01	0.04	0.08	0.03	0.08	0.15			
34	Uranium	mg/l		<0.001	0.0052	0.014	<0.001	<0.001	0.001	<0.001	<0.001	0.003			
35	Alkalinity/Bicarb	mg/l		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01			
36	Vanadium	mg/l		<0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01			
				0.8	3.50	5.9	1.4	7.61	23.0	0.9	15.9	52.0			

Enclosure 3

TDH
TEXAS DEPARTMENT OF HEALTH

TEXAS DEPARTMENT OF HEALTH

MEMO

TO: GENE FORRER
LICENSE FILE L02449

THRU: ROBERT FREE
ARTHUR TATE
RUTH MCBURNEY

FROM: OSCAR LESSARD

SUBJECT: RELEASE FOR UNRESTRICTED USE
PAWLIK PATTERN
USX CORPORATION, GEORGE WEST, TX

DATE: JUNE 5, 1998

PAWLIK PATTERN:

On December 15-17, 1997, Bureau of Radiation Control employees, Brad Caskey, Oscar Lessard, and Gene Forrer, performed a survey of the Pawlik Pattern at USX Corporation in George West, Texas. The surveys were performed using one-by-one sodium iodide probes and Ludlum 14C survey meters. The purpose of the survey was to allow the Licensee to release the 28.2 acres for unrestricted use. Two times background was used as an allowable limit (Regulatory Guide 5.10, Guidelines for Conducting Close Out Surveys of Open Lands and Requesting Release for Unrestricted Use). The survey was performed by walking 10 meters apart moving across the wellfield pattern. Background readings ranged from 1500 cpm for Oscar Lessard, 2000 cpm for Gene Forrer and 2400 cpm for Brad Caskey. Maps and survey results are attached (see Attachment A-1).

Sixteen areas were identified which exceeded two times background. These areas were cleaned up by the Licensee and resurveyed.

Sample #	Sample Identification	Pre-Cleanup (cpm)	Post-Cleanup (cpm)
1	30 E/W by 100 N/S	4000	4000
2	70 E/W by 100 N/S	5000	4000
3*	165 E/W by 120 N/S	10,000	4000
4	190 E/W by 170 N/S	6000	4000
5	130 E/W by 180 N/S	12,000	4000
6*	310 E/W by 160 N/S	20,000	4000

Sample #	Sample Identification	Pre-Cleanup (cpm)	Post-Cleanup (cpm)
7	355 E/W by 50 N/S	20,000	4000
8*	550 E/W by 230 N/S	35,000	4000
9	570 E/W by 230 N/S	40,000	5000
10	575 E/W by 230 N/S	12,000	4000
11	580 E/W by 210 N/S	10,000	4000
12	630 E/W by 175 N/S	10,000	4000
13	650 E/W by 175 N/S	5000	4000
14	610 E/W by 230 N/S	5000	4000
15	650 E/W by 225 N/S	10,000	4000
16*	700 E/W by 240 N/S	10,000	6000
Background*	360 E/W by 100 N/S	2400	2400

* soil samples obtained

Soil samples were retrieved from five areas (Sample #'s 3, 6, 8, 16, and Background) after the Licensee cleaned them up. Soil samples collected were representative of the 100 square meter by 15 centimeter in depth sampling method. Five each 15 centimeter deep core samples were collected in each 100 square meter area. The five core samples from each 100 square meter area were then dried and mixed together. A representative sample from the mixture was used for analysis. Results of the five soil samples for radium-226 and natural uranium concentrations in picocuries per gram (pCi/gm) are as follows:

Sample #	Radium-226 (pCi/gm)	Nat Uranium (pCi/gm)
3	5.4 (4.4)	2.3
6	5.4 (4.4)	2.8
8	6.9 (5.9)**	6.1
16	13 (12)**	<2.0
Background	1.0	<2.0

(x) results after subtracting background
** exceeds regulatory limits

Soil sample results were within regulatory limits for radium-226 and natural uranium soil concentrations (5 pCi/gm and 30 pCi/gm, respectively) except for soil sample #'s 8 and 16. Soil sample # 16 was taken from an area of approximately 200 square meters where the radiation levels were 6000 cpm over the entire area.

On April 28-30, 1998, Brad Caskey, Rick Munoz, Mike Dunn, and Oscar Lessard returned to the Pawlik Pattern to resurvey and retake soil samples after the Licensee recleaned the land areas identified as sample #8 and sample #16.

Results of the two soil samples for radium-226 and natural uranium concentrations in picocuries per gram (pCi/gm) are as follows (see Attachment A-2):

Sample #	Radium-226 (pCi/gm)	Nat Uranium (pCi/gm)
8	2.8 (1.8)	2.6
16	3.7 (2.7)	<2.0

(x) results after subtracting background

CONCLUSION:

Recommend Pawlik Pattern wellfield be released for unrestricted use.

NRC FORM **8C**
(7-94)
NRCMD 3.57

COVER SHEET FOR CORRESPONDENCE

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