

SOUTHWEST GROUNDWATER CONSULTING, LLC

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**Report on Findings Related to the Restoration of In-Situ
Uranium Mines in South Texas**

**Submitted to
Blackburn & Carter
4709 Austin Street
Houston, Texas 77004**

September 29, 2008

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Mr. Jim Blackburn
Blackburn & Carter
4709 Austin St.
Houston, TX 77004

RE: Report on Findings Related to the Restoration of In-Situ Uranium Mines in South Texas

Dear Mr. Blackburn:

You have asked me to research the files of the Texas Commission on Environmental Quality (TCEQ) to determine the track record of the Underground Injection Control (UIC) office with regard to the restoration of aquifers after mining operations have been completed. As part of my investigation, I have talked with representatives of the office of Underground Injection Control (Mr. Ben Knape, and Mr. David Murry). Mr. Knape made available, for inspection and copying, ring binders of documents related to each in-situ mining site in south Texas; and Mr. Murry gave me a collection of spreadsheets that allow for comparison of Original Restoration Target Values, Amended Restoration Target Values, and Last Sampled Values of 26 water quality indicators listed on each table of restoration values approved by TCEQ. It will be necessary to verify data from the ring binders and the spreadsheets made available by Mr. Knape and Mr. Murry with data from microfiche and microfilm files in the Central Records office of TCEQ. I found the microfiche and microfilm files in Central Records to be unorganized and difficult to navigate, without reference to paper and digital copies from which the data in Central Records were copied.

The spreadsheets were compiled by Mr. John Santos, retired geologist with the UIC program. A copy of the spreadsheet with dates that restoration tables were amended is included with this report as Attachment A. Tables of Original Restoration Target Values, Amended Restoration Target Values, and Final Sample Values are listed as Attachments B

through D. Comparisons of Original Restoration Target Values with Amended Restoration Target Values and Last Sampled Values for uranium, radium-226, arsenic, and sulfate are included as Attachments E through H. I am pulling together information from the large volume of data scanned from the files of UIC in an effort to re-produce and update all of Mr. Santos' spreadsheets. The final step will involve reconciliation of the above data with data from Central Records.

Regulation of In-Situ Uranium Mining

The regulation of in-situ uranium mining in Texas falls under the Texas Railroad Commission (TRC) and the Texas Commission on Environmental Quality (TCEQ). TRC oversees exploration, and TCEQ handles mine permitting, applications for aquifer exemptions, and aquifer restoration. The U.S. Environmental Protection Agency (USEPA) grants aquifer exemptions, based on recommendations made by TCEQ.

Restoration

Restoration is one of the final steps in the process of in-situ uranium mining. TCEQ sets restoration standards (in the form of Restoration Tables) in the mining permits of operators, based on 26 water quality indicators. Restoration standards vary from one Production Area to another, using background data and data from proposed Production Areas, as collected and submitted by mining companies. My survey of records at UIC and Attachments A through H reveals that Restoration Tables are routinely amended by TCEQ. Relaxed restoration standards allow operators to depart from original groundwater cleanup objectives.

Amended Restoration Tables

The columns in Attachment A list (1) the names of the in-situ uranium mines, (2) Production Area Authorization (PAA) numbers, (3) restoration methods used at each Production Area, (4 and 5) the starting and ending dates of restoration programs, (6) pore volumes of water removed, (7) millions of gallons of water removed, (8) the date a Restoration Table was amended, (9) the dates that wells at a Production Area were plugged, and (10) the revocation date of the mining permit.

Attachment A lists 76 Production Areas and 51 dates on which TCEQ approved Amended Restoration Tables. Some of the Production Areas have been combined, but the final count in **this** report is based on the number of sites listed in Column 1. Eighty sites are listed in Attachments B through H, and it will be important to reconcile discrepancies between listings in those attachments and the listings of Attachment A.

Some of the sites listed in the first column of Attachment A, such as Gruy, were never mined, and others, such as Kingsville Dome, are in production. In the latter case, the Original Restoration Tables remain applicable, until the operator requests amended values. New sites, such as Goliad, are not listed because Production Areas have not been delineated and Restoration Tables assigned. Thus far, I have not found, in UIC's records, evidence that requests for Amended Restoration Tables have been denied by TCEQ.

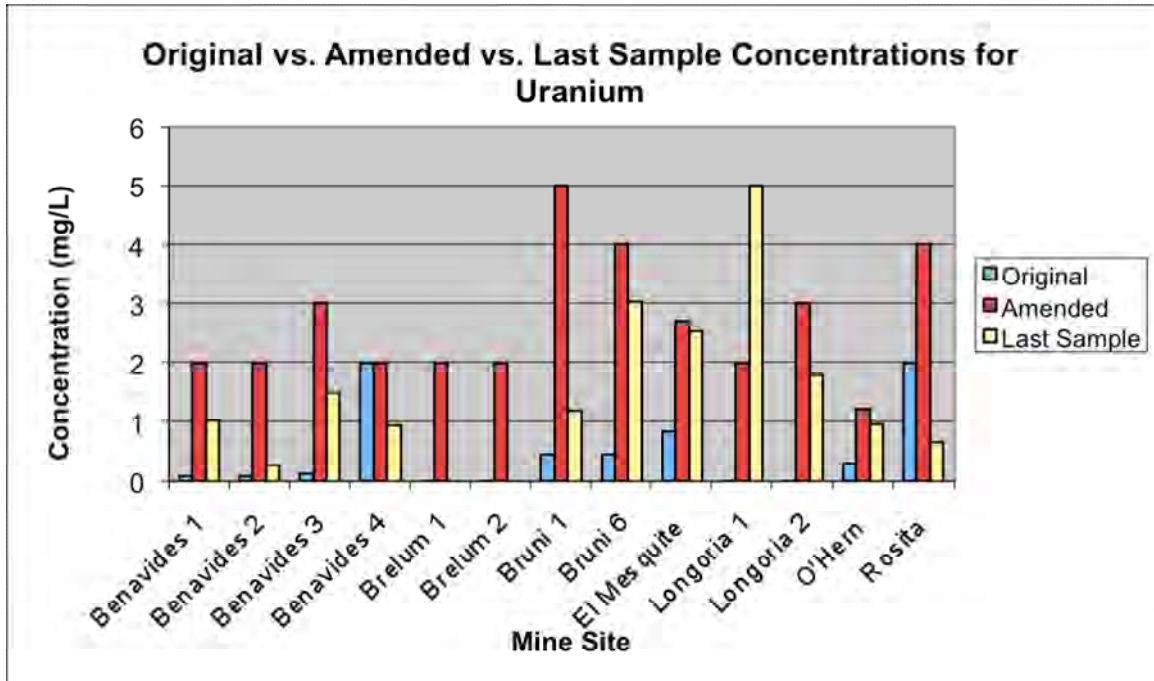
Figures

Figures 1 through 4 show, in the form of bar charts, the Original Restoration Target Values, Amended Restoration Target Values, and Last Sampled Values for uranium, radium-226, arsenic, and sulfate from mining sites for which all three values were recorded by Mr. Santos (Attachments E through H). The figures are based on data in the spreadsheets listed as Attachments B through D. Attachment B is the list of Original Restoration Target Values; Attachment C is the list of Final Restoration Target Values; and Attachment D is the list of Last Sample Values for all 26 water quality indicators. Attachments E through H list the differences and percent change between the Original Restoration Target Values and the Amended and Final Sample Values for uranium, radium-226, arsenic, and sulfate, respectively. The following observations are made with respect to Figures 1 through 4:

Uranium

- In all but two cases (Benevides 4 and Rosita), the Amended Restoration Table Values and the Last Sampled Concentrations of uranium for the Production Areas listed on Figure 1 (next page) exceed the Original Restoration Table Values approved by TCEQ.
- The Primary Drinking Water Standard (PDWS) for Uranium is 0.03 mg/l (or 30 µg/l).
- In all cases, the Amended and Last Sampled Concentrations of uranium exceed the PDWS.
- The higher Amended Restoration Values and the Last Sampled Concentrations are results of the inability of site operators to reduce uranium concentrations based on their respective proposed groundwater restoration programs. This calls into question the operators' understanding of the geochemistry of the hydrogeologic systems that they are exploiting.

Figure 1

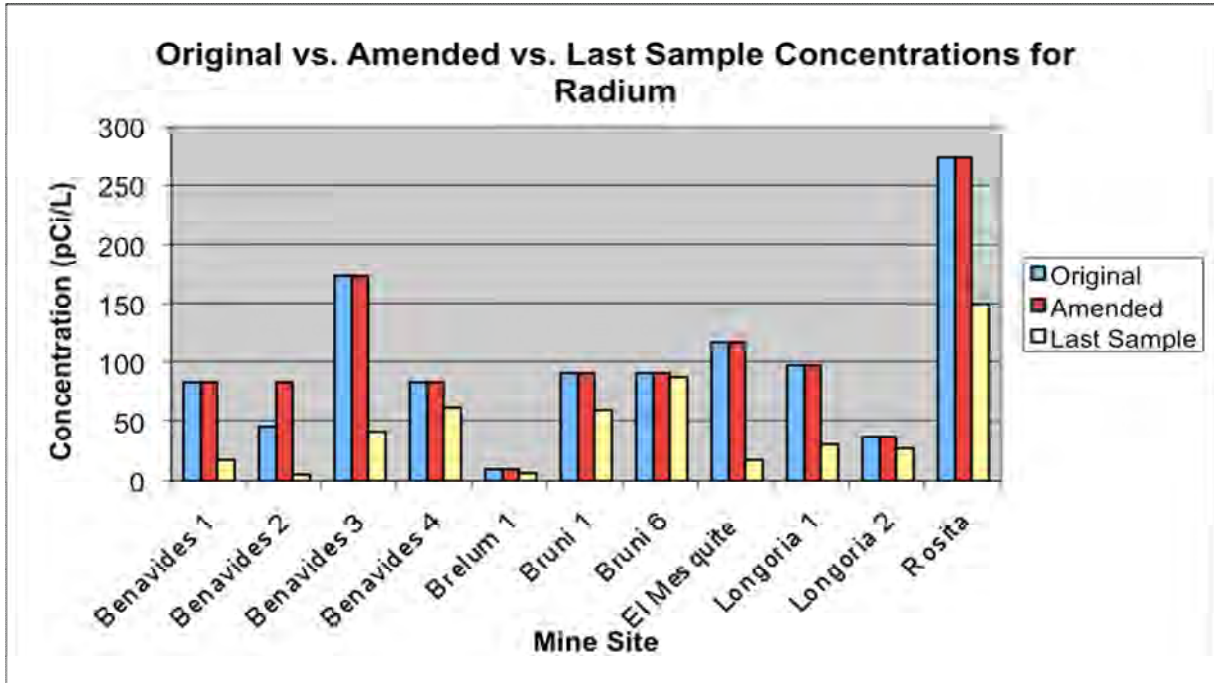


Radium-226

- All of the 12 Last-Sampled values were less than the Original Restoration Target Values (Attachment F).
- In all cases, radium-226 of the Amended Restoration Tables and Last Samples exceed the combined radium-226 and radium-228 PDWS of 5 picocuries per liter (pCi/L) (Attachment F; Figure 2, next page).
- The Original Restoration Table Values of radium-226 also exceed the radium-226/radium-228 PDWS of 5 pCi/L (Attachment F). What has not been established is the range of pre-exploration background radium-226 activities because (1) the Texas Water Development Board seldom includes radiochemical data in its groundwater chemistry database, and (2) the operators' methods of exploration have not been demonstrated not to destabilize uranium orebodies enough to release uranium and daughter products in sufficient concentrations and activities above

true background and pre-mining levels. In other words, adequate pre-exploration background studies have not been conducted.

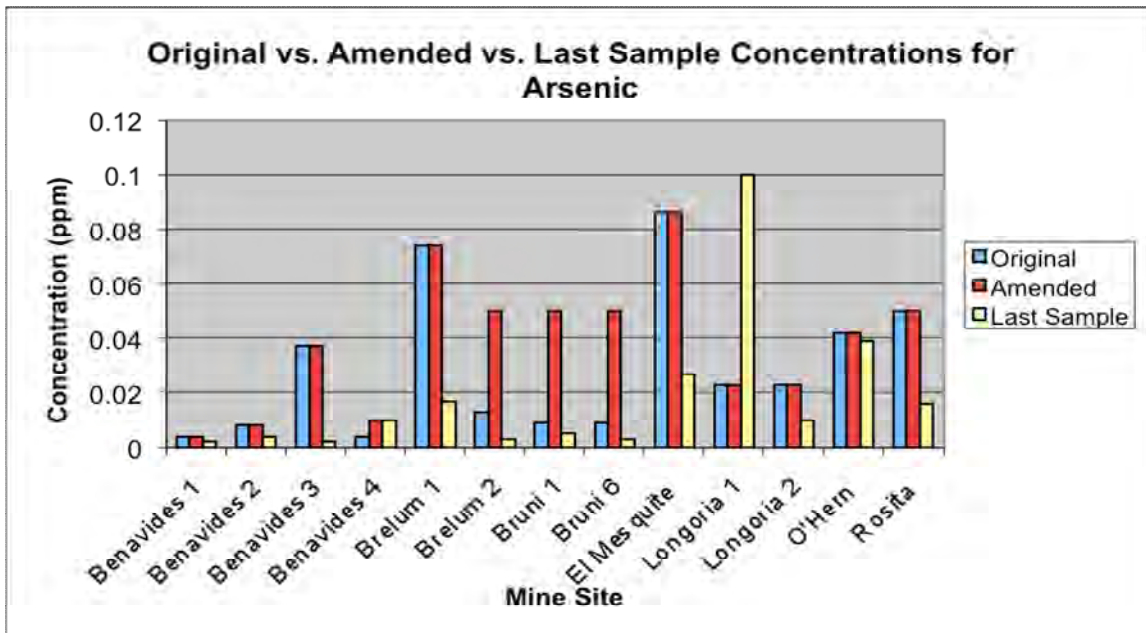
Figure 2



Arsenic

- In 53 of 73 cases, the Original Restoration Target Values exceed the current PDWS of 0.01 mg/l (10 µg/l) (Attachment G).
- In 25 cases, the Amended Restoration Target Values exceed the 53 Original Restoration Target Values (Attachment G).
- Seven of the 13 Last Sample Values are either equal to or greater than the PDWS of 0.01 mg/l (10 µg/l) (Figure 3, next page).
- The previous PDWS for arsenic was 0.05 mg/l.
- At 12 of the Production Areas, the Original Restoration Target Valued exceeded the old PDWS.

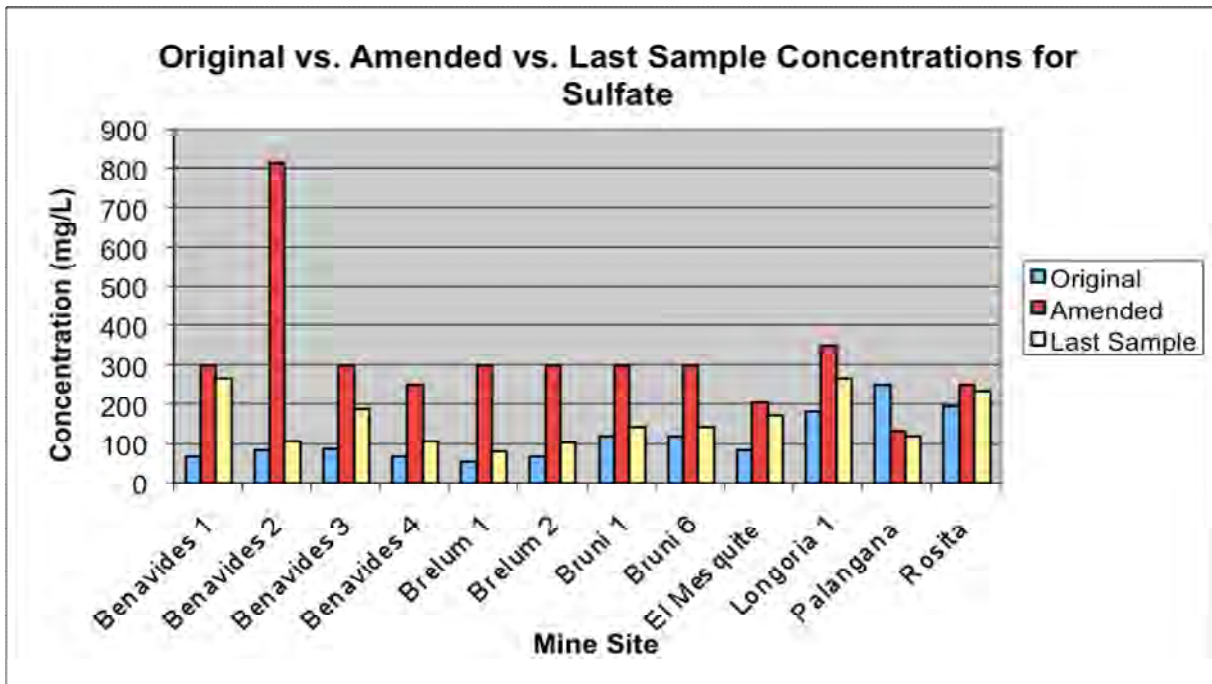
Figure 3



Sulfate

- With one exception, the Amended Restoration Target Values and Last-Sampled Concentrations of sulfate exceed the Original Restoration Target Values (Attachment H; Figure 4, next page).
- Although there is no PDWS for sulfate, the increased Amended and Last Sampled concentrations of sulfate underscore the potential for in-situ leach mining to increase major dissolved solids that affect the aesthetic properties of drinking water.

Figure 4



CONCLUSION

Based on data that I have evaluated as of the date of this letter report, I have found a minimum of 76 authorized in-situ uranium mining Production Areas in south Texas, and 51 dates on which Original Restoration Tables were amended by TCEQ (Attachment A). Other spreadsheets (Attachments B through H) show as many as 80 Production Areas. At least one of the mining areas (Gruy) was never developed. Others such as Kingsville Dome are still in production, so that amended restoration tables have not been issued.

Thus far, I have found it necessary to rely on data organized in ring binders at UIC, along with spreadsheets compiled by a retired geologist with the UIC program. The files in Central Records are on microfiche or microfilm, and there is no straightforward way to locate specific records without going through each file frame by frame. The system seems to be designed to make it difficult to find specific files at Central Records. This makes it necessary to rely on paper records and digital files which representatives of UIC are reluctant to certify as official records, even though official seals are affixed to

paper copies. TCEQ must find a way to make available certified paper records and digital files and to affirm the accuracy of each. Otherwise, researchers are condemned to sort through a morass of poorly organized microfiche and microfilm files at Central Records.

The large number of amended restoration tables indicates that TCEQ routinely grants requests for relaxed restoration standards at in-situ uranium mining sites. As of this date, I have found no evidence in correspondence between UIC and site operators that TCEQ has denied requests for Amended Restoration Tables.

The revision of a Table of Restoration Target Values is an admission, after the fact, that the operator of an in-situ uranium mine is unable to meet the original restoration standards for one or more of 26 water-quality indicators. Furthermore, there is no reasonable guarantee that natural conditions within an aquifer will lead to the restoration of contaminated groundwater from an in-situ uranium mine any sooner than would an aggressive program employing the latest groundwater treatment technologies.

I appreciate the opportunity to be of assistance on this matter. As noted above, I will continue to evaluate the large body of data made available by representatives of UIC, along with data from Central Records. Please call or contact me by email if you have questions regarding this letter report.

Sincerely,
SOUTHWEST GROUNDWATER CONSULTING, LLC

Bruce K. Darling, Ph.D., P.G.

Attachment A
Restoration History

Restoration History							
MINE	PAA	Method	Restoration		pore vol. removed	pore vol. = Mill. gal.	Rest. table amended
			Start	End			
Benavides		RO					8/12/91
Benavides	4	RO					
Boots/Brown	1						9/5/02
Brelum 106-20	1	RO					
Brelum 106-20	2	RO					
Bruni	1	changed to 05					
Bruni	2	changed to 05					
Bruni	3						
Bruni	4	added to 03					
Bruni	5-1	RO	Feb-90	Sep-90	2.4	14	2/25/91
Bruni	5-2	RO					2/3/92
Burns Ranch	1						8/14/89
Burns Ranch	2						
Burns/Moser	1						12/12/02
Burns/Moser	2						12/19/02
Burns/Moser	3						12/19/02
Burns/Moser	4						12/5/02
Clay West	1						9/9/99
Clay West	2						9/9/99
El Mesquite	1	RO					8/14/89
El Mesquite	2	RO & inj	Oct-90	Dec-99	6.4	66.8	5/6/01
El Mesquite	3	GW sweep, RO	Jan-94	Jan-04	11.5	29.5	11/3/04
El Mesquite	4	RO & inj	Jan-94	Oct-01	8.56	252	9/9/03
El Mesquite	7						
Gruy	1						
Gruy	2						
Gruy	3						
Hobson	1	GW sweep					1/8/90
Holiday	1						
Holiday	2	RO	Oct-90	May-99	6		3/9/00
Holiday	3	RO					2/20/89
Holiday	4	RO & inj	Sep-99	Nov-01	12.2	1.6	9/9/03
Holiday	5	RO & inj	Oct-00	Mar-04	12.5	27.3	1/31/93
Holiday	6	RO & inj	Sep-99	Apr-01	15.9	25	10/31/02
Holiday	7						
Kingsville Dorn	1						
Kingsville Dorn	2						
Lamprecht	1						
Lamprecht	2						
Lamprecht	3						
Lamprecht	4						
Las Palmas	1						2/14/93
Las Palmas	2						6/13/93

Restoration History							
MINE	PAA	Method	Restoration		pore vol. removed	pore vol. = Mill. gal.	Rest. table amended
			Start	End			
Las Palmas	3						7/13/92
Longoria	1	GW sweep					8/12/91
Longoria	2	GW sweep					8/12/91
McBryde	1	GW sweep					8/12/91
Mt Lucas	1						9/9/97
Mt Lucas	2	RO & inj	Mar-90	Mar-96	10.3		9/9/97
Mt Lucas	3						9/9/99
Mt Lucas	4						8/2/98
Mt Lucas	5	RO & inj	Jun-92	Mar-96	9.3		9/9/97
Mt Lucas	6	RO & inj	Mar-92	Sep-98	9		9/9/99
Mt Lucas	7	RO & inj	Jun-92	Oct-99	25.7	183	1/23/00
Mt Lucas	8	RO & inj	Jun-92	Dec-98	23.5		9/9/97
Nell	1	ion exchange					6/13/88
O'Hern	1						9/5/02
O'Hern	2	RO					
O'Hern	3						
O'Hern	4	RO & inj	Jan-94	Mar-01	10	15.4	10/31/02
Palangana							
Pawlik							6/22/00
Pawnee							10/22/98
Rosita							
Rosita	2						
Tex-1		RO & inj			12	152	1/23/00
Trevino		EDR			4.5	32.95	8/12/91
Trevino	2a	EDR	Aug-89	Jul-91	10	47.46	1/13/92
Trevino	2b	EDR	Sep-88	Nov-89	7.6	12.8	4/9/90
West Cole		RO & inj	Dec-93	Jun-00	10.7	39.1	6/28/01
West Cole	2	RO & inj	Dec-93	Dec-01	19	9.6	1/27/04
West Cole	3	RO & inj	Apr-95	Oct-03	12.1	225.9	3/12/06
Zamzow		RO & inj	Nov-90	Oct-98	7		6/28/01
Zamzow	2	RO & inj	Nov-90	Oct-98	7		6/28/01
Zamzow	3	RO & inj	Nov-90	Oct-98	7		6/28/01
Zamzow	4	RO & inj	Nov-90	Oct-98	7		6/28/01

Restorati		
MINE	Wells	Permit/PAA
	plugged	revoked
Benavides		4/2/03
Benavides	Jan-91	4/2/03
Boots/Brown	Jul-03	8/18/03
Brelum 106-20		2/2/89
Brelum 106-20		2/2/89
Bruni		
Bruni		
Bruni		
Bruni		
Bruni	Oct-91	
Bruni	Jan-93	
Burns Ranch		1/24/91
Burns Ranch		
Burns/Moser	Aug-03	
Burns/Moser	Dec-03	
Burns/Moser	Dec-03	
Burns/Moser	Mar-03	
Clay West		2/15/04
Clay West		
El Mesquite		
El Mesquite	Oct-01	
El Mesquite	Feb-05	
El Mesquite	Nov-03	
El Mesquite		
Gruy		
Gruy		
Gruy		
Hobson	Nov-91	1/24/91
Holiday		
Holiday	Jul-01	
Holiday	Dec-89	
Holiday	Nov-03	
Holiday	Dec-05	
Holiday	Mar-02	
Holiday		
Kingsville Dom		
Kingsville Dom		
Lamprecht		3/7/00
Lamprecht		3/7/00
Lamprecht		3/7/00
Lamprecht		3/7/00
Las Palmas		3/2/03
Las Palmas		3/2/03

Restorati		
MINE	Wells	Permit/PAA
	plugged	revoked
Las Palmas		3/2/03
Longoria		4/2/03
Longoria		4/2/03
McBryde		1/26/93
Mt Lucas		3/2/03
Mt Lucas		3/2/03
Mt Lucas		3/2/03
Mt Lucas		3/2/03
Mt Lucas		
Mt Lucas		3/2/03
Mt Lucas		3/2/03
Mt Lucas		3/2/03
Nell	Dec-88	7/25/89
O'Hern	Oct-03	1/25/07
O'Hern	Jan-92	1/25/07
O'Hern	May-01	1/25/07
O'Hern	Dec-02	1/25/07
Palangana		
Pawlik	Oct-00	4/2/02
Pawnee		3/7/00
Rosita		
Rosita		
Tex-1		3/2/03
Trevino	Dec-91	2/89
Trevino	Oct-92	2/89
Trevino	Oct-92	2/89
West Cole	Nov-01	
West Cole	Feb-04	
West Cole	May-06	
Zamzow		11/2/01
Zamzow		11/2/01
Zamzow		11/2/01
Zamzow		11/2/01

Attachment B
Original Restoration Target Values

Mt Lucas	6	50.2	9.2	477	15.4	--	271	192	57
Mt Lucas	7	31.2	6.8	351	10.1	--	336	167	31
Mt Lucas	8	32.2	6.6	295	10.9	--	372	145	21
Nell	1	79.2	4.14	1932	93	4.6	411.6	15.8	2955
O'Hern	1	0.2	2.9	347	9.7	--	347.8	141	295
O'Hern	2	13.7	2.7	310	9.7	1.78	347	129	255
O'Hern	*3	200	150	300	12	--	500	160	300
O'Hern	*4	14.12	2.8	307.7	9.06	17.57	190.1	132.1	278
Palangana	1	200	125	245	19.3	11	500	250	255
Pawlik	1A	144	29	750	32	--	197	14	140
Pawlik	1B	51	11	290	16	--	321	20	38
Pawnee	1	200	125	200	--	--	500	250	255
Rosita	1	155	53	422	26	--	204	196	866
Rosita	2	170	62	420	28	--	216	248	87
Rosita	3	153	47	751	34	--	231	496	955
Tex-1	1	69.4	2.4	365	34	--	317	147	44
Trevino	1	150	47	380	23	--	264	189	64
Trevino	2a	95.9	50.2	392.6	26.4	--	388.8	239.5	572
Trevino	2b	95.9	50.2	392.6	26.4	--	388.8	239.5	572
West Cole	1	6.64	1.5	295	10	16.4	333	92.4	20
West Cole	2	8.8	4	345	23	14	369	122	255
West Cole*	3	16.8	6.5	398	18.6	17	378	197	30
Zamzow	1	286	42.7	425	30.7	--	308	745	566
Zamzow	2	306	33	341	24	--	282	773	51
Zamzow	3	369	30	449.5	35.5	--	290.5	1018	499
Zamzow	4	395	39.5	430	59.5	--	328	793	72

Mt Lucas	6	1508	2567	222	0.003	0.0001	0.02	0.001	0.00
Mt Lucas	7	1115	1817	275	0.003	0.0001	0.02	0.001	0.00
Mt Lucas	8	967	1541	305	0.005	0.0001	0.01	0.001	0.00
Nell	1	5383	9539	337.4	0.028	0.001	1.21	0.455	0.255
O'Hern	1	1052	1728	278	0.2	0.01	2.9	0.25	5.0
O'Hern	2	979	1626		0.2	0.01	3.52	0.25	0.12
O'Hern	*3	1000			0.05	0.01	6.3	0.05	0.1
O'Hern	*4	952			0.042	0.011	0.63	0.02	0.01
Palangana	1	878	1281	251	0.05	0.01	0.6	0.1	0.1
Pawlik	1A	2607	4566		0.003	0.0002	0.27	0.001	0.02
Pawlik	1B	1002	1748	263	0.001	0.0001	0.29	0.001	0.03
Pawnee	1	903	1310		0.05	0.01	0.3	0.05	0.05
Rosita	1	1933	3388	169	0.009	0.0005	0.105	0.002	0.00
Rosita	2	2045	3519	177	0.014	0.0002	0.02	0.001	0.00
Rosita	3	2524	4276	189	0.068	0.002	0.13	0.003	0.00
Tex-1	1	1367	2160	260	0.028	0.0001	0.04	0.001	0.1
Trevino	1	1577	2761	221	0.089	0.01	0.2	0.04	0.24
Trevino	2a	1635			0.032	0.01	0.25	0.02	0.3
Trevino	2b								
West Cole	1	882.8	1441	296	0.121	0.0001	0.217	0.018	0.04
West Cole	2	1036	1656	324	0.044	0.0001	0.72	0.009	0.11
West Cole*	3	1234	1938	339	0.028	0.0008	0.58	0.017	0.04
Zamzow	1	2289	3204	275	0.013	0.001	0.29	0.004	0.17
Zamzow	2	2234	3155	245	0.01	0.001	0.15	0.001	0.1
Zamzow	3	2575	3200	238	0.001	0.0001	1.06	0.004	0.3
Zamzow	4	2510	3585	269	0.01	0.0001	4.06	0.006	0.3

Bruni	2			
Bruni	3			
Bruni	4			
Bruni	38107			
Bruni	38108	0.121		90.5
Burns Ranch	1			
Burns Ranch	2			
Burns/Moser	1	0.4		246.6
Burns/Moser	2	0.01		
Burns/Moser	3	0.1		758
Burns/Moser	4	0.01		568
Clay West	1	0.256		235
Clay West	2	0.1		420
El Mesquite	*1	0.015		9.98
El Mesquite	2	0.024		14.7
El Mesquite	3	0.036		116.68
El Mesquite	4	0.01		6.2
El Mesquite	7	0.03		10.3
Gruy	1	0.016		272
Gruy	2	0.02		24
Gruy	3	0.01		159
Hobson	1	0.133		45.1
Holiday	1	0.3		9.1
Holiday	2	0.1		5.45
Holiday	3	0.116		429.8
Holiday	4	0.01		6.8
Holiday	5	0.05		14.9
Holiday	6	0.06		19.6
Holiday	7	0.06		8.7
Kingsville Dome	1	0.06		21.63
Kingsville Dome	2	0.38		92
Lamprecht	1	0.144		150.7
Lamprecht	2	0.155		76.7
Lamprecht	3	0.291		127.6
Lamprecht	4	0.17		290
Las Palmas *	1	0.04		133.6
Las Palmas *	2	0.01		92.3
Las Palmas *	3	0.03		155

Mt Lucas	6	0.02	225.4
Mt Lucas	7	0.07	56.2
Mt Lucas	8	0.08	171
Nell	1	0.126	57.2
O'Hern	1	0.3	39
O'Hern	2	1.1	46.2
O'Hern	*3	1	
O'Hern	*4	0.2	29.49
Palangana	1	1	164
Pawlik	1A	0.01	92.5
Pawlik	1B	0.01	22.7
Pawnee	1	1	274
Rosita	1	0.05	183
Rosita	2	0.06	130.3
Rosita	3	2.53	87.29
Tex-1	1	0.014	246
Trevino	1	0.34	13.8
Trevino	2a	0.1	19
Trevino	2b		
West Cole	1	0.01	8.98
West Cole	2	0.01	*19.6
West Cole*	3	0.011	46
Zamzow	1	0.006	107.9
Zamzow	2	0.2	363.49
Zamzow	3	0.01	45.25
Zamzow	4	1.05	481.9

Attachment C
Final Restoration Target Values

Bruni	1	270	150	410	35		700	300	1100	1.8
Bruni	2									
Bruni	3	139								
Bruni	4	139								
Bruni	5-1	270								
Bruni	5-2	241	58.3	382	35		700	300	1010	1.8
Burns Ranch	1									
Burns Ranch	2									
Burns/Moser	1	85	13	321	18		400	90	463	1.44
Burns/Moser	2	103	17	264	16		290	160	320	1
Burns/Moser	3	120	13	174	12		390	90	225	1.2
Burns/Moser	4	220	36	191.5	16	1.8	370	350	270	0.9
Clay West	1	100	16	282	15		300	110	371	1.8
Clay West	2	95	16	354	17	0	320	300	424	1.1
El Mesquite	*1	75								
El Mesquite	2	20	3	315	8.95	17.92	420	100	200	0.96
El Mesquite	3	21.5	3.9	320	7.5	17.9	410	205	196.9	0.96
El Mesquite	4	36	8.5	370	8.5	17	440	300	301	1
El Mesquite	7									
Gruy (Not Min	1									
Gruy Not Mine	2									
Gruy (Not Min	3									
Hobson	1	70	3.5	370	35.8	6.6	429	253	425	0.94
Holiday	1									
Holiday	2	30	4	300	6.8	11.8	400	92.6	174	1.2
Holiday	3	38.8	15.4	449	16.4	3.8	244.8	92.6	630.4	0.47
Holiday	4	70	16	490	13	14	440	455	350	1.15
Holiday	5	46	17	445	11.1	4.4	385	285	582	0.58
Holiday	6	65	24.6	424	15.3	4	4480	270	643	2.7
Holiday	7									
Kingsville Dom	1									
Kingsville Dom	2									
Lamprecht	1	198	32.6	444	30.8	3.1	300	523	574	1.05
Lamprecht	2	combined with PAA1								
Lamprecht	3	combined with PAA1								
Lamprecht	4	combined with PAA1								
Las Palmas	1	220	43	292	21		300	230	610	0.55
Las Palmas	2	132.1	32.3	304	23	0	225	180	690	0.57

Bruni	1	0.05	0.01	1.945	0.056	0.139	0.002	0.051	200	5
Bruni	2									
Bruni	3									
Bruni	4									
Bruni	5-1									
Bruni	5-2	0.05	0.005	1.945	0.027	0.139	0.0009	0.051	200	4
Burns Ranch	1									
Burns Ranch	2									
Burns/Moser	1	0.275	0.01	65	0.028	0.15	0.003	0.07	5	0.3
Burns/Moser	2	0.02	0.0006	0.503	0.003	0.64	0.0055	0.06	1.2	1.7
Burns/Moser	3	0.059	0.0002	2	0.002	0.27	0.0006	0.002	0.2	1.25
Burns/Moser	4	0.65	0.0001	8	0.001	0.35	0.001	0.001	0.21	0.2
Clay West	1	0.07	0.0003	1.5	0.006	0.75	0.0009	0.02	2.9	0.8
Clay West	2	0.044	0.0018	6.1	0.008	3.3	0.0002	0.05	0.62	0.477
El Mesquite	*1									
El Mesquite	2	0.038	0.0002	0.313	0.516	0.05	0.00014	0.08	0.045	1.35
El Mesquite	3	0.086	0.00012	0.25	0.45	0.028	0.00025	0.105	0.49	2.7
El Mesquite	4	0.009	0.0002	0.18	0.002	0.06	0.0003	0.215	0.09	1.95
El Mesquite	7									
Gruy (Not Min	1									
Gruy Not Mine	2									
Gruy (Not Min	3									
Hobson	1	0.422	0.009	2.09	0.04	0.331	0.00064	0.008	75.5	0.29
Holiday	1									
Holiday	2	0.03	0.005	0.32	0.03	0.02	0.009	0.6	0.2	0.5
Holiday	3	0.08	0.0001	0.272	1.97	0.022	0.0001	0.026	0.138	2
Holiday	4	0.008	0.0001	0.27	0.0065	0.05	0.0002	0.155	0.12	2.55
Holiday	5	0.015	0.0004	0.09	0.002	0.04	0.0001	0.061	0.012	1.095
Holiday	6	0.02	0.0001	0.2	0.001	0.1	0.0001	0.37	0.1	2.3
Holiday	7									
Kingsville Dom	1	-	-	-	-	-	-	-	-	-
Kingsville Dom	2	-	-	-	-	-	-	-	-	-
Lamprecht	1	0.013	0.007	0.332	0.014	0.121	0.0009	0.012	0.635	0.757
Lamprecht	2									
Lamprecht	3									
Lamprecht	4									
Las Palmas	1	0.073	0.0001	0.2	0.0053	0.5	0.0006	0.564	10	7
Las Palmas	2	0.019	0.0001	0.45	0.02	0.31	0.0001	0.14	0.167	2

Attachment D
Last Sampled Values

Bruni		2			
Bruni		3			
Bruni		4			
Bruni	5-1				
Bruni	5-2		0.5		88
Burns Ranch		1			
Burns Ranch		2			
Burns/Moser		1			
Burns/Moser		2			
Burns/Moser		3			
Burns/Moser		4			
Clay West		1			
Clay West		2			
El Mesquite	*1				
El Mesquite		2			
El Mesquite		3	0.097		17.1
El Mesquite		4			
El Mesquite		7			
Gruy		1			
Gruy		2			
Gruy		3			
Hobson		1			
Holiday		1			
Holiday		2			
Holiday		3			
Holiday		4			
Holiday		5			
Holiday		6			
Holiday		7			
Kingsville Dom		1			
Kingsville Dom		2			
Lamprecht		1			
Lamprecht		2			
Lamprecht		3			
Lamprecht		4			
Las Palmas		1			
Las Palmas		2			
Las Palmas		3			

Mt Lucas		6		
Mt Lucas		7		
Mt Lucas		8		
Nell		1		
O'Hern		1		
O'Hern		2		
O'Hern	*3			
O'Hern	*4		0.72	
Palangana		1		
Pawlik	1A			
Pawlik	1B			
Pawnee		1	0.64	149
Rosita		1		
Rosita		2		
Rosita		3		
Tex-1		1		
Trevino		1		
Trevino	2a			
Trevino	2b			
West Cole		1		
West Cole		2		
West Cole		3		
Zamzow		1		
Zamzow		2		
Zamzow		3		
Zamzow		4		

Attachment E
Uranium Restoration History

Uranium					
Restoration Table Amendment History					
MINE	PAA	Original mg/l	Amended mg/l	% Change	
Benavides	1	0.083	2	2309.63855	
Benavides	2	0.078	2	2464.10256	
Benavides	3	0.12	3	2400	
Benavides	4	2	2	0	
Boots/Brown	1	0.28	0.28	0	
Brelum 106-20	1	0.037	2	5305.40541	
Brelum 106-20	2	0.0308	2	6393.50649	
Bruni	1	0.461	5	984.598698	
Bruni	2	0	0		
Bruni	3	0	0		
Bruni	4	0	0		
Bruni	5-1	0	0		
Bruni	5-2	0.461	4	767.678959	
Burns Ranch	1	0	0		
Burns Ranch	2	0	0		
Burns/Moser	1	0.3	0.3	0	
Burns/Moser	2	0.05	1.7	3300	
Burns/Moser	3	0.082	1.25	1424.39024	
Burns/Moser	4	0.02	0.2	900	
Clay West	1	0.4	0.8	100	
Clay West	2	0.477	0.477	0	
El Mesquite	*1	0.039	0		
El Mesquite	2	0.085	1.35	1488.23529	
El Mesquite	3	0.84	2.7	221.428571	
El Mesquite	4	0.062	1.95	3045.16129	
El Mesquite	7	0.097	0		
Gruy	1	1.12	0		
Gruy	2	0.045	0		
Gruy	3	0.739	0		
Hobson	1	0.025	0.29	1060	
Holiday	1	0.23	0		
Holiday	2	0.2	0.5	150	
Holiday	3	1.6	2	25	
Holiday	4	0.036	2.55	6983.33333	
Holiday	5	0.063	1.095		
Holiday	6	0.368	2.3	525	
Holiday	7	0.1	0		
Kingsville Dom	1	0.164	-		
Kingsville Dom	2	1.89	-		
Lamprecht	1	0.16	0.757	373.125	
Lamprecht	2	0.266	0		
Lamprecht	3	0.9	0		
Lamprecht	4	0.9	0		
Las Palmas	1	2.913	7	140.302094	
Las Palmas	2	0.566	2	253.35689	

Uranium					
Restoration Table Amendment History					
MINE	PAA	Original mg/l	Amended mg/l	% Change	
Las Palmas	3	2.4	5	108.333333	
Longoria	1	0.047	2	4155.31915	
Longoria	2	0.037	3	8008.10811	
McBryde	1	0.831	4	381.347774	
Mt Lucas	1	0.293	0.55	87.7133106	
Mt Lucas	2	0.076	0.5	557.894737	
Mt Lucas	3	0.77	1.75	127.272727	
Mt Lucas	4	0.097	1.6	1549.48454	
Mt Lucas	5	0.258	1.5	481.395349	
Mt Lucas	6	0.125	2	1500	
Mt Lucas	7	0.047	1	2027.65957	
Mt Lucas	8	0.334	1.25	274.251497	
Nell	1	0.041	2	4778.04878	
O'Hern	1	0.28	1.55	453.571429	
O'Hern	2	0.371	0		
O'Hern	*3	2	0		
O'Hern	*4	0.307	1.2	290.879479	
Palangana	1	2	2	0	
Pawlik	1A	0.002	0.02	900	
Pawnee	1B	0.002	0.002	0	
Rosita	1	2	4		
Rosita	1	0.35	-		
Silver Lake	2	0.547	-		
Silver Lake	3	0.586	-		
Tex-1	1	0.05	1	1900	
Trevino	1	0.015	2		
Trevino	2a	0.036	2		
Trevino	2b	0	-		
West Cole	1	0.169	2.75	1527.21893	
West Cole	2	0.662	2.5	277.643505	
West Cole	3	1.66	3.15	89.7590361	
Zamzow	1	0.01	3	29900	
Zamzow	2	0.017	0		
Zamzow	3	0.85	0		
Zamzow	4	0.217	0		

Attachment F
Radium-226 Restoration History

Radium 266				
Restoration Table Amendment History				
MINE	PAA	Original pCi/l	Amended pCi/l	% Change
Benavides	1	83	83	0
Benavides	2	45.17	83	83.7502767
Benavides	3	173.1	173.1	0
Benavides	4	83	83	0
Boots/Brown	1	9.45	150	1487.30159
Brelum 106-20	1	9.36	9.36	0
Brelum 106-20	2	1536.5	1536.5	0
Bruni	1	90.5	90.5	0
Bruni	2	0	0	
Bruni	3	0	0	
Bruni	4	0	0	
Bruni	5-1	0	0	
Bruni	5-2	90.5	90.5	0
Burns Ranch	1	0	0	
Burns Ranch	2	0	0	
Burns/Moser	1	246.6	450	82.4817518
Burns/Moser	2	0	529	
Burns/Moser	3	758	758	0
Burns/Moser	4	568	675	18.8380282
Clay West	1	235	380	61.7021277
Clay West	2	420	420	0
El Mesquite	*1	9.98	0	
El Mesquite	2	14.7	46	212.92517
El Mesquite	3	116.68	116.68	0
El Mesquite	4	6.2	20	222.580645
El Mesquite	7	10.3	0	
Gruy	1	272	0	
Gruy	2	24	0	
Gruy	3	159	0	
Hobson	1	45.1	70	55.210643
Holiday	1	9.1	0	
Holiday	2	5.45	26.6	388.073394
Holiday	3	429.8	429.8	0
Holiday	4	6.8	19	179.411765
Holiday	5	14.9	28.5	91.2751678
Holiday	6	19.6	71	262.244898
Holiday	7	8.7	0	
Kingsville Dome	1	21.63	-	
Kingsville Dome	2	92	-	
Lamprecht	1	150.7	218.3	44.8573324
Lamprecht	2	76.7	0	
Lamprecht	3	127.6	0	
Lamprecht	4	290	0	
Las Palmas	1	133.6	134	0.2994012

Radium 266				
Restoration Table Amendment History				
MINE	PAA	Original	Amended	% Change
		pCi/l	pCi/l	
Las Palmas	2	92.3	100	8.34236186
Las Palmas	3	155	170	9.67741935
Longoria	1	97	97	0
Longoria	2	36.72	37	0.76252723
McBryde	1	365	100	-72.6027397
Mt Lucas	1	535.8	962	79.5446062
Mt Lucas	2	391	950	142.966752
Mt Lucas	3	314.6	940	198.792117
Mt Lucas	4	150.8	300	98.938992
Mt Lucas	5	323	750	132.198142
Mt Lucas	6	225.4	750	232.741792
Mt Lucas	7	56.2	250	344.839858
Mt Lucas	8	171	550	221.637427
Nell	1	57.2	57.2	0
O'Hern	1	39	0	
O'Hern	2	46.2	0	
O'Hern	*3	0	0	
O'Hern	*4	29.49	0	
Palangana	1	164	275	67.6829268
Pawlik	1A	92.5	92.5	0
Pawnee	1B	22.7	22.7	0
Rosita	1	274	274	0
Rosita	1	183	-	
Silver Lake	2	130.3	-	
Silver Lake	3	87.29	-	
Tex-1	1	246	372	51.2195122
Trevino	1	13.8	131	849.275362
Trevino	2a	19	226	1089.47368
Trevino	2b	0	-	
West Cole	1	8.98	21.5	139.420935
West Cole	2	*19.6	0	
West Cole	3	46	46	0
Zamzow	1	107.9	200	85.3568119
Zamzow	2	363.49	0	
Zamzow	3	45.25	0	
Zamzow	4	481.9	0	

Attachment G
Arsenic Restoration History

Arsenic					
Restoration Table Amendment History					
MINE	PAA	Original mg/l	Amended mg/l	% Change	
Benavides	1	0.004	0.004	0	
Benavides	2	0.008	0.008	0	
Benavides	3	0.037	0.037	0	
Benavides	4	0.004	0.01	150	
Boots/Brown	1	0.059	0.059	0	
Brelum 106-20	1	0.074	0.074	0	
Brelum 106-20	2	0.013	0.05	284.615385	
Bruni	1	0.009	0.05	455.555556	
Bruni	2	0	0		
Bruni	3	0	0		
Bruni	4	0	0		
Bruni	5-1	0	0		
Bruni	5-2	0.009	0.05	455.555556	
Burns Ranch	1	0	0		
Burns Ranch	2	0	0		
Burns/Moser	1	0.076	0.275	261.842105	
Burns/Moser	2	0.02	0.02	0	
Burns/Moser	3	0.007	0.059	742.857143	
Burns/Moser	4	0.001	0.65	64900	
Clay West	1	0.05	0.07	40	
Clay West	2	0.044	0.044	0	
El Mesquite	*1	0.007	0		
El Mesquite	2	0.038	0.038	0	
El Mesquite	3	0.086	0.086	0	
El Mesquite	4	0.002	0.009	350	
El Mesquite	7	0.001	0		
Gruy	1	0.035	0		
Gruy	2	0.083	0		
Gruy	3	0.043	0		
Hobson	1	0.15	0.422	181.333333	
Holiday	1	0.03	0		
Holiday	2	0.03	0.03	0	
Holiday	3	0.08	0.08	0	
Holiday	4	0.008	0.008	0	
Holiday	5	0.015	0.015		
Holiday	6	0.02	0.02	0	
Holiday	7	0.05	0		
Kingsville Dorn	1	0.005	-		
Kingsville Dorn	2	0.006	-		
Lamprecht	1	0.013	0.013	0	
Lamprecht	2	0.011	0		
Lamprecht	3	0.026	0		
Lamprecht	4	0.01	0		
Las Palmas	1	0.0272	0.073	168.382353	

Arsenic					
Restoration Table Amendment History					
MINE	PAA	Original mg/l	Amended mg/l	% Change	
Las Palmas	2	0.01	0.019	90	
Las Palmas	3	0.03	0.03	0	
Longoria	1	0.023	0.023	0	
Longoria	2	0.023	0.023	0	
McBryde	1	0.041	0.041	0	
Mt Lucas	1	0.0057	0.0057	0	
Mt Lucas	2	0.0014	0.007	400	
Mt Lucas	3	0.008	0.02	150	
Mt Lucas	4	0.015	0.1	566.666667	
Mt Lucas	5	0.003	0.2	6566.66667	
Mt Lucas	6	0.003	0.005	66.6666667	
Mt Lucas	7	0.003	0.15	4900	
Mt Lucas	8	0.005	0.006	20	
Nell	1	0.028	0.028	0	
O'Hern	1	0.2	0.2	0	
O'Hern	2	0.2	0		
O'Hern	*3	0.05	0		
O'Hern	*4	0.042	0.042	0	
Palangana	1	0.05	0.05	0	
Pawlik	1A	0.003	0.003	0	
Pawnee	1B	0.001	0.001	0	
Rosita	1	0.05	0.05	0	
Rosita	1	0.009	-		
Silver Lake	2	0.014	-		
Silver Lake	3	0.068	-		
Tex-1	1	0.028	0.35	1150	
Trevino	1	0.089	0.2	124.719101	
Trevino	2a	0.032	0.05	56.25	
Trevino	2b	0	-		
West Cole	1	0.121	0.121	0	
West Cole	2	0.044	0.12	172.727273	
West Cole	3	0.028	0.13	364.285714	
Zamzow	1	0.013	0.2	1438.46154	
Zamzow	2	0.01	0		
Zamzow	3	0.001	0		
Zamzow	4	0.01	0		

Attachment H
Sulfate Restoration History

Sulfate					
Restoration Table Amendment History					
MINE	PAA	Original	Amended	% Change	
		mg/l	mg/l		
Benavides	1	69	300	334.782609	
Benavides	2	85	814	857.647059	
Benavides	3	86	300	248.837209	
Benavides	4	69	250	262.318841	
Boots/Brown	1	43	75	74.4186047	
Brelum 106-20	1	54.14	300	454.118951	
Brelum 106-20	2	67.08	300	347.227191	
Bruni	1	118	300	154.237288	
Bruni	2	0	0		
Bruni	3	125	0		
Bruni	4	80	0		
Bruni	5-1	118	0		
Bruni	5-2	118	300	154.237288	
Burns Ranch	1	0	0		
Burns Ranch	2	0	0		
Burns/Moser	1	39	90	130.769231	
Burns/Moser	2	123	160	30.0813008	
Burns/Moser	3	18	90	400	
Burns/Moser	4	10.3	350	3298.05825	
Clay West	1	85	110	29.4117647	
Clay West	2	201	300	49.2537313	
El Mesquite	*1	61	0		
El Mesquite	2	90.62	100	10.3509159	
El Mesquite	3	83.2	205	146.394231	
El Mesquite	4	102	300	194.117647	
El Mesquite	7	96	0		
Gruy	1	1197	0		
Gruy	2	214	0		
Gruy	3	144	0		
Hobson	1	156	253	62.1794872	
Holiday	1	78	0		
Holiday	2	92.6	92.6	0	
Holiday	3	92.6	92.6	0	
Holiday	4	90	455	405.555556	
Holiday	5	80	285		
Holiday	6	112	270	141.071429	
Holiday	7	61	0		
Kingsville Dorn	1	204	-		
Kingsville Dorn	2	224	-		
Lamprecht	1	60.35	523	766.611433	
Lamprecht	2	617	0		
Lamprecht	3	636.5	0		
Lamprecht	4	520	0		
Las Palmas *	1	96.2	230	139.085239	

Sulfate					
Restoration Table Amendment History					
MINE	PAA	Original	Amended	% Change	
		mg/l	mg/l		
Las Palmas *	2	94	180	91.4893617	
Las Palmas *	3	103	250	142.718447	
Longoria	1	182.5	350	91.7808219	
Longoria	2	206	450	118.446602	
McBryde	1	138	500	262.318841	
Mt Lucas	1	76.2	1000	1212.33596	
Mt Lucas	2	77.2	100	29.5336788	
Mt Lucas	3	83.4	95	13.9088729	
Mt Lucas	4	26	150	476.923077	
Mt Lucas	5	72	110	52.7777778	
Mt Lucas	6	192	110	-42.7083333	
Mt Lucas	7	167	250	49.7005988	
Mt Lucas	8	145	250	72.4137931	
Nell	1	15.8	225	1324.05063	
O'Hern	1	141	300	112.765957	
O'Hern	2	129	200	55.0387597	
O'Hern	*3	160	0		
O'Hern	*4	132.1	0		
Palangana	1	250	132.1	-47.16	
Pawlik	1A	14	250	1685.71429	
Pawlik	1B	20	275	1275	
Pawnee	1	250	20	-92	
Rosita	1	196	250	27.5510204	
Rosita	2	248	-		
Rosita	3	496	-		
Tex-1	1	147	-		
Trevino	1	189	400	111.640212	
Trevino	2a	239.5	500	108.768267	
Trevino	2b	239.5	450	87.8914405	
West Cole	1	92.4	-		
West Cole	2	122	92.4	-24.2622951	
West Cole*	3	197	122	-38.071066	
Zamzow	1	745	197	-73.557047	
Zamzow	2	773	793	2.58732212	
Zamzow	3	1018	0		
Zamzow	4	793	0		