40-8943

CROW BUTTE RESOURCES, INC.

86 Crow Butte Road
P.O. Box 169
Crawford, Nebraska 69339-0169

(308) 665-2215
(308) 665-2341 – FAX

September 18, 2001

Mr. Michael Linder
Director
Nebraska Department of Environmental Quality
PO Box 98922
Lincoln, Nebraska 68509-8922

Subject: Class III Underground Injection Control Permit Number NE 0122611
2002 Surety Estimate

Dear Mr. Linder:

Attached is the annual update to the surety estimate for the Crow Butte Uranium Mine. The estimate for 2002 is $12,324,113.

Upon approval, Crow Butte Resources, Inc. will provide a secured letter of credit on the renewal date to the State of Nebraska in an amount equal to the updated surety estimate.

If you have any questions or require any further information, please do not hesitate to call me at (308) 665-2215.

Sincerely,
CROW BUTTE RESOURCES, INC.

Michael Griffin
Manager of Health, Safety, and Environmental Affairs

Enclosure

Missouri public

public per Mike Hampton

cc: Mr. Melvyn Leach, Chief
Fuel Cycle Licensing Branch, FCSS
c/o Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

U.S. Nuclear Regulatory Commission
Mr. Mike Layton - ADDRESSEE ONLY
Fuel Cycle Licensing Branch
Mail Stop T-8A33
Washington, DC 20555

Steve Collings – CBR, Denver

Crow Butte Resources, Inc.
Crow Butte Uranium Project 2001-2002 Surety Estimate
(Revised September 2001)

Total Restoration and Reclamation Cost Estimate			
I.	Groundwater Restoration (Sheets 2 to 4)		$6,284,777
II.	Wellfield Reclamation (Sheets 5 to 8)		$2,553,901
III.	Commercial Plant Reclamation/Decommissioning (Sheets 9 to 12)		$348,423
IV.	R.O. Building Reclamation/Decommissioning (Sheets 9 to 12)		$51,239
V.	Evaporation Pond Reclamation (Sheets 13 to 16)		$474,813
VI.	Miscellaneous Site Reclamation (Sheets 17 to 19)		$76,424
VII.	Deep Disposal Well Reclamation (Sheet 20)		$69,714
VII.	I-196 Brule Aquifer Restoration (Sheets 21 to 22)		$24,917
	Subtotal Reclamation and Restoration Cost Estimate		$9,859,291
	Contract Administration	10%	$985,929
	Contingency	15%	$1,478,894
		TOTAL	$12,324,113

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Ground Water Restoration

				Mine Unit 1	Mine Unit 2	Mine Unit 3	Mine Unit 4	Mine Unit 5	Mine Unit 6	Mine Unit 7	Mine Unit 8	Mine Unit 9
I.	Ground Water Sweep Costs											
	PV's Required			1	1	1	1	1	1	1	1	1
	Total Kgals for Treatment			17164	18018	15894	28918	43569	52372	52055	45553	0
	Ground Water Sweep Unit Cost ($/Kgal)	(Sheet 23)		$0.531	$0.531	$0.531	$0.531	$0.531	$0.531	$0.531	$0.531	$0.531
	Subtotal Ground Water Sweep Costs per Wellfield			**$9,107**	**$9,560**	**$8,433**	**$15,343**	**$23,116**	**$27,787**	**$27,619**	**$24,169**	**$0**
Total Ground Water Sweep Costs				**$145,136**								
II.	Reverse Osmosis Costs											
	PV's Required			6	6	6	6	6	6	6	6	6
	Total Kgals for Treatment			102986	108110	95367	173511	261412	314234	312332	273319	0
	Reverse Osmosis Unit Cost ($/Kgal)	(Sheet 24)		$2.01	$2.01	$2.01	$2.01	$2.01	$2.01	$2.01	$2.01	$2.01
	Subtotal Reverse Osmosis Costs per Wellfield			**$206,784**	**$217,073**	**$191,485**	**$348,388**	**$524,883**	**$630,944**	**$627,124**	**$548,792**	**$0**
Total Reverse Osmosis Costs				**$3,295,473**								
III.	Recirculation Costs											
	PV's Required			1	1	1	1	1	1	1	1	1
	Total Kgals for Treatment			17164	18018	15894	28918	43569	52372	52055	45553	0
	Recirculation Unit Cost ($/Kgal)	(Sheet 25)		$0.71	$0.71	$0.71	$0.71	$0.71	$0.71	$0.71	$0.71	$0.71
	Subtotal Recirculation Costs per Wellfield			**$12,111**	**$12,714**	**$11,215**	**$20,405**	**$30,742**	**$36,954**	**$36,731**	**$32,143**	**$0**
Total Recirculation Costs				**$193,015**								
IV.	Consumables											
	Spare parts, filters and consumables =	$ 17,323	year									
	Active restoration period (months)			6.6	6.2	5.5	10.0	15.2	24.0	22.4	8.1	0.0
	Consumable usage (months restoration x annual rate estimate)			$9,470	$8,950	$7,896	$14,363	$21,927	$34,645	$32,321	$11,649	$0
	Subtotal Consumables per Mine Unit			**$9,470**	**$8,950**	**$7,896**	**$14,363**	**$21,927**	**$34,645**	**$32,321**	**$11,649**	**$0**
Total Consumables Costs				**$141,222**								

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Ground Water Restoration														
						Mine Unit 1	Mine Unit 2	Mine Unit 3	Mine Unit 4	Mine Unit 5	Mine Unit 6	Mine Unit 7	Mine Unit 8	Mine Unit 9
V.	Monitoring and Sampling Costs													
	Guideline 8 analysis =		$130	analysis										
	6 parameter in-house analysisi =		$47	analysis										
	Total restoration wells					10	12	18	43	33	33	46	25	30
	Total monitor wells					14	13	13	29	52	60	41	55	60
	Groundwater sweep duration (months)					0.34	0.36	0.32	0.57	0.88	0.99	1.29	0.32	0
	RO/recirculation duration (months)					6.22	5.84	5.15	9.38	14.31	23.67	21.1	7.75	0
	Stabilization duration (months)					6	6	6	6	6	6	6	6	0
	A. Restoration Well Sampling													
	1. Well Sampling prior to restoration start													
	# of Wells					10	12	18	43	33	33	46	25	30
	$/sample					$130	$130	$130	$130	$130	$130	$130	$130	$130
	2. Groundwater Sweep Sampling													
	# of Wells					10	12	18	43	33	33	46	25	30
	Total # samples					10	12	18	43	33	33	59	30	30
	$/sample					$47	$47	$47	$47	$47	$47	$47	$47	$47
	3. RO and Recirculation Sampling													
	# of Wells					10	12	18	43	33	33	46	25	30
	Total # samples					62	70	93	403	472	781	971	194	0
	$/sample					$130	$130	$130	$130	$130	$130	$130	$130	$130
	4. Stabilization Sampling													
	# of Wells					10	12	18	43	33	33	46	25	30
	Total # samples					60	72	108	258	198	198	276	150	0
	$/sample					$130	$130	$130	$130	$130	$130	$130	$130	$130
	5. Monitor Well Sampling													
	# of Wells					14	13	13	29	52	60	41	55	60
	$/sample					$47	$47	$47	$47	$47	$47	$47	$47	$47
	Total # samples (2/mo for entire period)					352	317	298	925	2204	3679	2328	1548	0
	6. Other Laboratory Costs													
	Radon, urinalysis, etc. =		$806	month										
	Total for Other Laboratory Costs:					$5,287	$4,997	$4,409	$8,020	$12,243	$19,344	$18,046	$6,504	$0
	Subtotal Monitoring and Sampling Costs per Mine Unit					**$39,461**	**$40,480**	**$47,731**	**$145,036**	**$208,772**	**$325,368**	**$298,325**	**$128,640**	**$5,310**
Total Monitoring and Sampling Costs						**$1,239,124**								

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Ground Water Restoration										
				Mine Unit 1	Mine Unit 2	Mine Unit 3	Mine Unit 4	Mine Unit 5	Mine Unit 6	Mine Unit 7	Mine Unit 8	Mine Unit 9
VI.	Supervisory Labor Cost											
	Engineer Support =	$6,677	month									
	HP Technician support =	$5,563	month									
	Active restoration period (months)			6.6	6.2	5.5	10.0	15.2	24.0	22.4	8.1	0.0
	Stabilization period (months)			6	6	6	6	6	6	6	6	0
	1 Engineer support during active restoration			$43,798	$41,395	$36,521	$66,432	$101,417	$160,237	$149,488	$53,880	$0
	2 HP Technician support during active restoration			$36,492	$34,489	$30,428	$55,349	$84,498	$133,506	$124,550	$44,891	$0
	3 Engineer support during final stabilization										$40,059	$0
	4 HP Technician support during final stabilization										$33,377	$0
	Subtotal Supervisory Labor per Mine Unit			$80,290	$75,884	$66,949	$121,781	$185,915	$293,743	$274,038	$172,207	$0
Total Supervisory Labor Costs				$1,270,807								
TOTAL RESTORATION COST PER WELLFIELD				$357,223	$364,661	$333,709	$665,316	$995,356	$1,349,442	$1,296,159	$917,601	$5,310
TOTAL GROUND WATER RESTORATION COSTS				$6,284,777								

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Wellfield Reclamation									
	Mine Unit 1	Mine Unit 2	Mine Unit 3	Mine Unit 4	Mine Unit 5	Mine Unit 6	Mine Unit 7	Mine Unit 8	Mine Unit 9
Wellfield Piping									
Assumptions:									
Number of Wellhouses	2	3	4	5	7	7	6	4	0
Total Mine Unit surface area	9.27	11.70	13.46	23.72	31.80	34.60	43.70	32.10	0.00
Total length of 2-inch production and injection lines (ft)	30000	34000	39520	68900	106080	128700	130500	20800	0
Total length of 3/8-inch hose (ft)					66300				
Total length 1-1/4-inch stinger pipe (ft)	43200	47400	57400	101400	0	91200	97500	72000	0
Total length of 2-inch downhole production pipe (ft)	15200	20800	22800	38400	74800	74800	80000	56000	0
Total Length of Trunkline (6-inch) (ft)	1000	1600							
Total Length of Trunkline (8-inch) (ft)	4400	1300	1450	5400	3700	2000	1000	3000	0
Total Length of Trunkline (10-inch) (ft)									
Total Length of Trunkline (12-inch) (ft)			1500	2000	14100	10000	13000	7000	0
Total Length of All Trunkline (ft)	5400	2900	2950	7400	17800	12000	16000	10000	0
Total number of production wells	38	52	57	96	189	194	179	140	0
Total nomber of injection wells	72	79	96	169	219	293	300	240	0
Total number of shallow monitor wells	3	3	3	11	25	28	25	30	30
Total number of perimeter monitor wells	11	10	10	18	27	32	16	25	30
I. Production and Injection Piping									
A. Removal and Loading									
Production and Injection Piping Removal Unit Cost ($/ft of pipe)	$0.53	$0.53	$0.53	$0.53	$0.53	$0.53	$0.53	$0.53	$0.53
Subtotal Production and Injection Piping Removal and Loading Costs	*$15,951*	*$18,077*	*$21,012*	*$36,633*	*$56,401*	*$68,428*	*$72,575*	*$11,059*	*$0*
B. Pipe Shredding									
Production and Injection Piping Shredding Unit Cost ($/ft of pipe)	$0.53	$0.53	$0.53	$0.53	$0.53	$0.53	$0.53	$0.53	$0.53
Subtotal Production and Injection Piping Removal and Loading Costs	*$15,951*	*$18,077*	*$21,012*	*$36,633*	*$56,401*	*$68,428*	*$72,575*	*$11,059*	*$0*
C. Equipment Costs									
IT12 Loader Unit Costs for removal	$24,171	$27,393	$31,841	$55,512	$85,467	$103,692	$109,977	$16,758	$0
Shredder Unit Costs for shredding	$6,400	$7,253	$8,431	$14,699	$22,630	$27,456	$29,120	$4,437	$0
Subtotal Equipment Costs	*$30,571*	*$34,647*	*$40,272*	*$70,211*	*$108,098*	*$131,148*	*$139,097*	*$21,196*	*$0*
D. Transport and Disposal Costs (NRC-Licensed Facility)									
Chipped Volume Reduction (ft^3/ft)	0.0069	0.0069	0.0069	0.0069	0.0069	0.0069	0.0069	0.0069	0.0069
Chipped Volume per Wellfield (yd^3)	7.7	8.7	10.1	17.6	27.1	32.9	34.9	5.3	0.0
Volume for Disposal Assuming 25% Void Space (yd^3)	10	11	13	22	34	41	44	7	0
Transportation and Disposal Unit Cost ($/$yd^3$)	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30
Subtotal Production and Injection Piping Transport and Disposal Costs	*$1,493*	*$1,642*	*$1,941*	*$3,285*	*$5,076*	*$6,121*	*$6,569*	*$1,045*	*$0*
Total Production and Injection Piping Costs	**$63,965**	**$72,443**	**$84,237**	**$146,762**	**$225,976**	**$274,125**	**$290,816**	**$44,359**	**$0**

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Wellfield Reclamation

	Mine Unit 1	Mine Unit 2	Mine Unit 3	Mine Unit 4	Mine Unit 5	Mine Unit 6	Mine Unit 7	Mine Unit 8	Mine Unit 9
II. Trunklines									
A. Removal and Loading									
Trunkline Removal Unit Cost ($/ft of pipe)	$1.20	$1.20	$1.20	$1.20	$1.20	$1.20	$1.20	$1.20	$1.20
Subtotal Trunkline Removal and Loading Costs	*$6,460*	*$3,469*	*$3,529*	*$8,853*	*$21,294*	*$14,356*	*$7,178*	*$11,963*	*$0*
B. Pipe Shredding									
Trunkline Shredding Unit Cost ($/ft of pipe)	$1.20	$1.20	$1.20	$1.20	$1.20	$1.20	$1.20	$1.20	$1.20
Subtotal Trunkline Shredding Costs	*$6,460*	*$3,469*	*$3,529*	*$8,853*	*$21,294*	*$14,356*	*$7,178*	*$11,963*	*$0*
C. Equipment Costs									
IT12 Loader Unit Costs for removal	$9,789	$5,257	$5,348	$13,415	$32,268	$21,754	$10,877	$18,128	$0
Shredder Unit Costs for shredding	$2,592	$1,392	$1,416	$3,552	$8,544	$5,760	$2,880	$4,800	$0
Subtotal Equipment Costs	*$12,381*	*$6,649*	*$6,764*	*$16,967*	*$40,812*	*$27,514*	*$13,757*	*$22,928*	*$0*
D. Transport and Disposal Costs (NRC-Licensed Facility)									
Chipped Volume Reduction (6-inch) (ft^3/ft)	0.0651	0.0651	0.0651	0.0651	0.0651	0.0651	0.0651	0.0651	0.0651
Chipped Volume Reduction (8-inch) (ft^3/ft)	0.1103	0.1103	0.1103	0.1103	0.1103	0.1103	0.1103	0.1103	0.1103
Chipped Volume Reduction (10-inch) (ft^3/ft)	0.1712	0.1712	0.1712	0.1712	0.1712	0.1712	0.1712	0.1712	0.1712
Chipped Volume Reduction (12-inch) (ft^3/ft)	0.2408	0.2408	0.2408	0.2408	0.2408	0.2408	0.2408	0.2408	0.2408
Chipped Volume per Wellfield (yd^3)	20.4	9.2	19.3	39.9	140.9	97.4	48.7	74.7	0.0
Volume for Disposal Assuming 25% Void Space (ft^3)	25.0	11.0	24.0	50.0	176.0	122.0	61.0	93.0	0.0
Transportation and Disposal Unit Cost ($/$ft^3$)	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30
Subtotal Transport and Disposal Costs	*$3,733*	*$1,642*	*$3,583*	*$7,465*	*$26,277*	*$18,215*	*$9,107*	*$13,885*	*$0*
Total Trunkline Costs	**$29,034**	**$15,230**	**$17,405**	**$42,137**	**$109,677**	**$74,439**	**$37,220**	**$60,739**	**$0**
III. Downhole Pipe									
A. Removal and Loading									
Downhole Piping Removal Unit Cost ($/ft of pipe)	$0.060	$0.060	$0.060	$0.060	$0.060	$0.060	$0.060	$0.060	$0.060
Downhole Hosing Removal Unit Cost ($/ft of pipe)	$0.120	$0.120	$0.120	$0.120	$0.120	$0.120	$0.120	$0.120	$0.120
Removal of 1-1/4-inch stinger pipe	$2,584	$2,835	$3,433	$6,065	$0	$5,455	$5,832	$4,307	$0
Removal of downhole production pipe	$909	$1,244	$1,364	$2,297	$4,474	$4,474	$4,785	$3,350	$0
Removal of downhole hose	$0	$0	$0	$0	$7,931	$0	$0	$0	$0
Subtotal Downhole Piping Removal and Loading Costs	*$3,493*	*$4,080*	*$4,797*	*$8,362*	*$12,406*	*$9,929*	*$10,617*	*$7,656*	*$0*
B. Pipe Shredding									
Downhole Piping Shredding Unit Cost ($/ft of pipe)	$0.053	$0.053	$0.053	$0.053	$0.053	$0.053	$0.053	$0.053	$0.053
Subtotal Downhole Piping Shredding Costs	*$3,105*	*$3,626*	*$4,264*	*$7,433*	*$3,977*	*$8,826*	*$9,437*	*$6,806*	*$0*
C. Equipment Costs									
Smeal Unit Costs for removal	$3,270	$3,819	$4,491	$7,829	$4,189	$9,296	$9,940	$7,168	$0
Shredder Unit Costs for shredding	$1,246	$1,455	$1,711	$2,982	$1,596	$3,541	$3,787	$2,731	$0
Subtotal Equipment Costs	*$4,516*	*$5,274*	*$6,202*	*$10,811*	*$5,785*	*$12,837*	*$13,727*	*$9,899*	*$0*
D. Transport and Disposal Costs (NRC-Licensed Facility)									
Chipped Volume Reduction - 1-1/4-inch stinger (ft^3/ft)	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044
Chipped Volume Reduction - 2-inch downhole production (ft^3/ft)	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074	0.0074
Volume Reduction - 3/8-inch hose (ft3/ft)	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313
Chipped Volume - 1-1/4-inch stinger (ft^3)	190	209	253	446	0	401	429	317	0
Chipped Volume - 2-inch downhole production (ft^3)	112	154	169	284	554	554	592	414	0
Volume 3/8-inch hose (ft3)	0	0	0	0	2075	0	0	0	0
Volume for Disposal Assuming 25% Void Space (yd^3)	14.0	16.8	19.5	33.8	121.7	44.2	47.3	33.9	0.0
Transportation and Disposal Unit Cost ($/$yd^3$)	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30	$149.30
Subtotal Downhole Piping Transport and Disposal Costs	*$2,091*	*$2,505*	*$2,912*	*$5,048*	*$18,170*	*$6,600*	*$7,057*	*$5,054*	*$0*
Total Downhole Piping Costs	**$13,206**	**$15,485**	**$18,176**	**$31,654**	**$40,337**	**$38,193**	**$40,838**	**$29,415**	**$0**

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Wellfield Reclamation									
	Mine Unit 1	Mine Unit 2	Mine Unit 3	Mine Unit 4	Mine Unit 5	Mine Unit 6	Mine Unit 7	Mine Unit 8	Mine Unit 9
IV. Surface Reclamation									
A. Removal and disposal of contaminated soil around wells									
Volume of contaminated soil (0.37 yd3 per injection and production well)	40.7	48.47	56.61	98.05	150.96	180.19	177.23	140.6	0
Disposal of contaminated soil $149.30 per yd3	$6,077	$7,237	$8,452	$14,639	$22,538	$26,902	$26,460	$20,992	$0
Equipment (IT12 loader at 2 yd3/hr)	$922	$1,098	$1,283	$2,222	$3,421	$4,083	$4,016	$3,186	$0
Labor (1 man-hour per 2 Yd3)	$304	$362	$423	$733	$1,129	$1,347	$1,325	$1,051	$0
Subtotal removal and disposal of contaminated soil	*$7,303*	*$8,697*	*$10,158*	*$17,594*	*$27,088*	*$32,333*	*$31,802*	*$25,229*	*$0*
B. Recontour and seeding									
Recontour and seeding (est. $300/acre)	$2,780	$3,510	$4,037	$7,117	$9,540	$10,380	$13,110	$9,630	$0
Subtotal Recontour and Seeding	*$2,780*	*$3,510*	*$4,037*	*$7,117*	*$9,540*	*$10,380*	*$13,110*	*$9,630*	*$0*
Total Surface Reclamation	**$10,083**	**$12,207**	**$14,195**	**$24,711**	**$36,628**	**$42,713**	**$44,912**	**$34,859**	**$0**
IV. Well Houses									
Total Quantity	2	3	4	5	7	7	6	4	0
Average Well House Weight (Lbs.)	6000	6000	6000	6000	6000	6000	6000	6000	6000
A. Removal									
Dismantlement at 2-man-days per wellhouse (man-days)	4	6	8	10	14	14	12	8	0
Dismantlement Labor Costs	$479	$718	$957	$1,196	$1,675	$1,675	$1,436	$957	$0
Equipment (IT12 at 2 hours per wellhouse) (hrs)	4	6	8	10	14	14	12	8	0
Equipment Costs	$181	$272	$363	$453	$634	$634	$544	$363	$0
Subtotal Well House Dismantlement Costs	*$660*	*$990*	*$1,320*	*$1,649*	*$2,309*	*$2,309*	*$1,979*	*$1,320*	*$0*
B. Disposal									
Total Disposal Weight (6000 lbs per wellhouse) (Lbs)	12000	18000	24000	30000	42000	42000	36000	24000	0
Subtotal Disposal Costs	*$111*	*$167*	*$222*	*$278*	*$389*	*$389*	*$333*	*$222*	*$0*
Total Well House Removal and Disposal Costs	**$771**	**$1,156**	**$1,542**	**$1,927**	**$2,698**	**$2,698**	**$2,312**	**$1,542**	**$0**
TOTAL REMOVAL AND DISPOSAL COSTS PER WELLFIELD	**$117,058**	**$116,521**	**$135,554**	**$247,191**	**$415,316**	**$432,167**	**$416,098**	**$170,913**	**$0**
TOTAL WELLFIELD BUILDINGS AND EQUIPMENT REMOVAL AND DISPOSAL COSTS	**$2,050,819**								

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				Well Abandonment								
				Mine Unit 1	Mine Unit 2	Mine Unit 3	Mine Unit 4	Mine Unit 5	Mine Unit 6	Mine Unit 7	Mine Unit 8	Mine Unit 9
I.	**Well Abandonment (Wellfields)**											
	# of Production Wells			38	52	57	96	189	194	179	140	0
	# of Injection Wells			72	79	96	169	219	293	300	240	0
	# of Monitoring Wells			14	13	13	29	52	60	41	55	60
	Total Number of Wells			124	144	166	294	460	547	520	435	60
	Average Diameter of Casing (inches)			5	5	5	5	5	5	5	5	5
	Average Depth (ft)			665	631	774	698	675	515	762	500	770
	Well Abandonment Unit Cost ($/ft. of well)			$0.2854	$0.2854	$0.2854	$0.2854	$0.2854	$0.2854	$0.2854	$0.2854	$0.2854
	Subtotal Abandonment Cost per Wellfield			**$23,536**	**$25,935**	**$36,673**	**$58,573**	**$88,625**	**$80,406**	**$113,098**	**$62,081**	**$13,187**
II.	**Downhole Pump Disposal**											
	Number of Downhole Pumps		350									
	Pump Disposal Volume(ft3)		0.5									
	Total Pump Disposal Volume(yd3)		6.5									
	Downhole Pump Disposal Rate ($/yd3)		$149.30									
	Subtotal Downhole Pump Disposal			**$968**								
Total Wellfield Abandonment Costs				**$503,082**								

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Plant Equipment Decommissioning	Commercial Plant	R.O. Building
I. Removal and Loading Costs		
Tankage		
Number of Contaminated Tanks	27	
Volume of Contaminated Tank Construction Material (ft^3)	521	
Number of Chemical Tanks	7	
Disposal Void Factor	1.25	
A. Labor to Remove and Load Tankage		
Number of Persons	2	
Tanks/Day	1	
Number of Days	34	
$/Day/Person	$120	
Subtotal Removal Labor Costs	*$8,135*	
B. Labor to Clean Chemical Tankage		
Number of Persons	1	
Tanks/Day	1	
Number of Days	7	
$/Day/Person	$120	
Subtotal Cleaning Labor Costs	*$837*	
C. Equipment		
Saws, scaffolding, etc.	$5,708	
Subtotal Equipment Costs	*$5,708*	
Total Equipment Removal and Loading Costs	**$14,680**	
II. Transportation and Disposal Costs (NRC-Licensed Facility)		
A. Tankage		
Volume of Tank Construction Material (ft^3)	521	
Volume for Disposal Assuming Void Space (yd^3)	24.1	
Transportation and Disposal Unit Cost ($/$yd^3$)	$149.30	
Subtotal Tankage Transportation and Disposal Costs	*$3,602*	
B. Contaminated PVC Pipe		
Volume of Shredded PVC Pipe (ft^3)	158.4	
Volume for Disposal Assuming Void Space (yd^3)	7.3	
Transportation and Disposal Unit Cost ($/$yd^3$)	$149.30	
Subtotal Contaminated PVC Pipe Transportation and Disposal Costs	*$1,095*	

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Plant Equipment Decommissioning				
			Commercial Plant	**R.O. Building**
C.	Pumps			
	Volume of Process Pumps (yd^3) (no void factor used)		5.6	
	Transportation and Disposal Unit Cost ($/$yd^3$)		$149.30	
	Subtotal Pump Transportation and Disposal Costs		*$829*	
D.	Filters (injection, backwash and yellowcake filters)			
	Volume of Filters (yd^3) (no void factor used)		14.8	
	Transportation and Disposal Unit Cost ($/$yd^3$)		$149.30	
	Subtotal Filter Transportation and Disposal Costs		*$2,212*	
E.	Dryer			
	Dryer Volume (yd^3) (no void factor used)		14.81481481	
	Transportation and Disposal Unit Cost ($/$yd^3$)		$149.30	
	Total Dryer Transportation and Disposal Costs		*$2,212*	
Total Contaminated Equipment Transportation and Disposal Costs			**$9,950**	
III.	**Transportation and Disposal (Solid Waste for Landfill Disposal)**			
A.	Cleaned Tankage			
	Volume of Tank Construction Material (ft^3)		135	
	Number of Landfill Trips		1	
	Transportation and Disposal Unit Cost ($/Load)		$370	
	Subtotal Tankage Transportation and Disposal Costs		*$370*	
B.	Uncontaminated PVC Pipe			
	Volume of Shredded PVC Pipe (ft^3)		158.4	
	Number of Landfill Trips		1	
	Transportation and Disposal Unit Cost ($/Load)		$370	
	Subtotal PVC Pipe Transportation and Disposal Costs		*$370*	
Total Uncontaminated Equipment Transportation and Disposal Costs			**$740**	
IV.	**Supervisory Labor Costs During Plant Decommissioning**			
	Estimated Duration (months)		6	
	Engineer		$40,059	
	Radiation Technician		$33,377	
	Total Supervisory Labor Costs		**$73,436**	
SUBTOTAL EQUIPMENT REMOVAL AND DISPOSAL COSTS PER FACILITY			$98,806	
	Building Area (Ft2)		34,000	5,000
	Building Equipment Removal and Disposal Cost per Square Foot		$2.91	$2.91
TOTAL EQUIPMENT REMOVAL AND DISPOSAL COSTS			**$98,806**	**$14,530**

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Building Demolition			Commercial Plant	R.O. Building
I.	**Decontamination Costs**			
	A.	Wall Decontamination		
		Area to be Decontaminated (ft^2)	24,000	
		HCl Application Rate (Gallons/ft^2)	1	
		HCl Acid Cost	$0.66	
		Subtotal Wall Decontamination Materials Costs	$15,841	
	B.	Concrete Floor Decontamination		
		Area to be Decontaminated (ft^2)	17530	
		HCl Application Rate (Gallons/ft^2)	2	
		HCl Acid Cost	$0.66	
		Subtotal Floor Decontamination Materials Costs	$23,140	
	C.	Decontamination Labor		
		Labor (man-days)	60	
		Subtotal Decontamination Labor Cost	$7,178	
	D.	Decontamination Equipment Costs		
		Sprayer pump	$500	
		Recycle pump	$500	
		Sprayer with hose	$1,000	
		Subtotal Decontamination Equipment Costs	$2,000	
	E.	Decontamination Waste Disposal (to Ponds)		
		Total gallons HCl waste	59,060	
		Pumping costs (5 HP/30 gpm)	$367	
	Subtotal Decontamination Costs		$48,526	
	Total Decontamination Costs		**$48,526**	
II.	**Demolition Costs**			
		Assumptions (based on costs to move plant from Texas in 1988):		
		Dismantling interior steel, tanks, pumps, etc.	$66,600	
		Dismantling plant building	$43,800	
	A.	Building Dismantling		
		Dismantle interior components (1988 $'s escalated by CPI)	$100,210	
		Plant building dismantling (1988 $'s escalated by CPI)	$65,904	
		Subtotal Building Dismantling	*$166,113*	
	B.	Concrete Floor Removal		
		Area of direct-dispose concrete floors (ft2)	5,450	
		Removal Rate ($/ft2)	$2.72	
		Subtotal Concrete Floor Removal	*$14,824*	
	Total Demolition Costs		**$180,937**	

Building Demolition

	Commercial Plant	R.O. Building
III. Disposal Costs		
A. Concrete Floor		
Area of Direct-Dispose Concrete Floor (ft^2)	5,450	
Average Thickness of Concrete Floor (ft)	0.5	
Volume of Concrete Floor (ft^3)	2,725	
Volume of Concrete Floor (cy)	101	
Transportation and Disposal Unit Cost ($\$/Yd^3$)	$149.30	
Subtotal Concrete Floor Disposal Costs	*$15,068*	
Total Disposal Costs	**$15,068**	
IV Plant Site Reclamation		
A. Plant Site Earthwork		
Material to be Moved (Yd3)	20,000	
D8N Bulldozer Earthwork Rate (Yd3/hr)	700	
D8N Hourly Rate	$136	
Subtotal Plant Site Earthwork	*$3,886*	
B. Revegetation		
Area requiring Revegetation (Ac)	4	
Revegetation Unit Cost ($/Ac)	$300	
Subtotal Plant Site Revegetation	*$1,200*	
Total Plant Site Reclamation Costs	**$5,086**	
SUBTOTAL BUILDING DEMOLITION AND DISPOSAL COSTS	$249,617	
Building Area (Ft2)	34,000	5,000
Building Demolition Cost per Square Foot	$7.34	$7.34
TOTAL BUILDING DEMOLITION AND DISPOSAL COSTS	**$249,617**	**$36,708**

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Evaporation Pond Reclamation			
		Commercial Ponds	**R&D Ponds**
Assumptions/Data:			
Number of Ponds		3	2
Area of Ponds (ft2)		250,000	50,000
Thickness of Liner Material (ft)		0.00833	0.0030
Leak detection piping size (in)		4	3
Leak detection piping length (ft/pond)		2,100	600
Earthwork Requirements (Yd3/pond)		60,000	30,000
Surface Restoration/Revegetation (Acres)		20	10
Sludge Production Rate (Yd3 sludge/gal)			0.000000102
(1 Yd3 sludge/9,772,000 gal R&D Phase)			
Estimated 1991 to 2001 Total Production (gallons)		17,487,990,000	
Liner Removal Rate (ft2/man-day)		10,000	10,000
Sludge Removal Rate (Yd3/man-day)		8.33	8.33
I. Pond Liner and Piping Removal			
A. Pond Liner and Piping Removal Labor			
Area of Ponds		750,000	100,000
Liner Removal Rate (ft2/Man-Day)		10,000	10,000
Total Man-Days		75	10
Labor Rate ($/man-day)		$119.63	$119.63
Subtotal Liner and Piping Removal Labor Costs		*$8,972*	*$1,196*
B. Pond Liner and Piping Removal Equipment			
Total Man-Days Removal Effort		75	10
Size of Crew		4	4
Total Days Removal Effort		18.75	2.5
Loader Hourly Rate ($/hr)		$45.32	$45.32
Subtotal Liner and Piping Removal Equipment Costs		*$6,798*	*$906*
Total Pond Liner and Piping Removal Costs		**$15,770**	**$2,103**

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Evaporation Pond Reclamation						
					Commercial Ponds	**R&D Ponds**
II.	**Pond Sludge Removal**					
		Pond Sludge Estimate				
			Estimated Production Flow since 1991 (gal)		17,487,990,000	
			Historical Sludge Production Rate		0.000000102	
			Estimated Pond Sludge Volume (Yd3)		1,790	Cleaned following R&D
	A.	Pond Sludge Removal Labor				
			Pond Sludge Volume (Yd3)		1,790	
			Sludge Removal Rate (Yd3/man-day)		8.33	
			Total Man-Days		215	
			Labor Rate ($/man-day)		$120	
		Subtotal Pond Sludge Removal Labor Costs			*$25,691*	*$0*
	B.	Pond Sludge Removal Equipment				
			Total Man-Days Removal Effort		215	
			Size of Crew		3	
			Total Days Removal Effort		72	
			Loader Hourly Rate ($/hr)		$45.32	
		Subtotal Pond Sludge Removal Equipment Costs			*$25,954*	*$0*
	Total Pond Sludge Removal Costs				**$51,644**	**$0**
III.	**Pond Byproduct Material Disposal**					
	A.	Pond Liner Disposal				
			Area of Pond Liner (ft2)		750,000	100,000
			Thickness of Pond Liner (ft)		0.00833	0.00300
			Volume of Pond Liner (ft3)		6,248	300
			Void Space Factor		1.25	1.25
			Total Disposed Volume (yd3)		289	14
			Disposal Unit Costs ($/yd3)		$149.30	$149.30
		Subtotal Pond Liner Disposal Costs			*$43,183*	*$2,074*

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Evaporation Pond Reclamation										
									Commercial Ponds	**R&D Ponds**
	B.	Pond Piping Disposal								
			Total Length of Piping						6,300	1,200
			Piping Volume Factor (ft3/ft)						0.0103	0.0069
			Total Volume Pond Piping (ft3)						65	8
			Void Space Factor						1.25	1.25
			Total Disposed Volume (yd3)						3.0	0.4
			Disposal Unit Costs ($/yd3)						$149.30	$149.30
		Subtotal Pond Liner Disposal Costs							*$449*	*$57*
	B.	Pond Sludge Disposal								
			Total Volume Pond Sludge (Yd3)						1,790	
			Disposal Unit Costs ($/Yd3)						$149.30	
		Subtotal Pond Sludge Disposal Costs							*$267,188*	*$0*
	Total Byproduct Material Disposal Costs								**$310,819**	**$2,131**
IV	**Pond Site Reclamation**									
	A.	Pond Earthwork Requirements								
			Earthwork Requirements Yd3)						180,000	60,000
			D8N Bulldozer Earthwork Rate (Yd3/hr)						700	700
			Total D8N Hours						257	86
			D8N Hourly Rate						$136	$136
		Subtotal Pond Earthwork							*$34,971*	*$11,657*
	B.	Revegetation								
			Area requiring Revegetation (Ac)						20	10
			Revegetation Unit Cost ($/Ac)						$300	$300
		Subtotal Plant Site Revegetation							*$6,000*	*$3,000*
	Total Pond Site Reclamation Costs								**$40,971**	**$14,657**

Evaporation Pond Reclamation			
		Commercial Ponds	**R&D Ponds**
V.	**Supervisory Labor Costs During Pond Reclamation**		
	Estimated Duration (months)	3	
	Engineer Rate ($/month)	$6,677	
	Total Engineer Labor	$20,030	
	Radiation Technician Rate ($/month)	$5,563	
	Total Radiation Tecnician Labor	$16,688	
	Total Supervisory Labor Costs	**$36,718**	**$0**
TOTAL EVAPORATION POND RECLAMATION PER POND		**$455,923**	**$18,891**
TOTAL EVAPORATION POND RECLAMATION COSTS		**$474,813**	

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Miscellaneous Site Reclamation			
I.	**Access Road Reclamation**		
	Assumptions		
	Road Reclamation production rate (Yd3/hr)		200
	Length of Main Access Roads (ft)		6,700
	Average Main Access Road width (ft)		25
	Depth of Main Access Road Gravel Surface (ft)		1
	Surface Area of Main Access Road (Ac)		3.8
	Length of Wellfield Access Roads (ft)		30,000
	Average Wellfield Access Road width (ft)		12
	Depth of Wellfield Access Road Gravel Surface (ft)		0 5
	Surface Area of Wellfield Road (Ac)		8.3
A.	Main Access Road Dirtwork		
	Main Access Road Gravel Volume (Yd3)		6,204
	Total reclamation time (hrs)		31
	D8N Unit Operating Cost ($/hr)		$136
	Subtotal Main Access Road Gravel Roadbase Removal Costs		*$4,219*
B.	Wellfield Road Dirtwork		
	Wellfield Road Gravel Volume (Yd3)		6,667
	Total reclamation time (hrs)		33
	D8N Unit Operating Cost ($/hr)		$136
	Subtotal Wellfield Road Gravel Roadbase Removal Costs		*$4,533*
E.	Discing/Seeding		
	Assumptions		
	Surface Area (acres)		12.1
	Discing/Seeding Unit Cost ($/acre)		$300
	Subtotal Discing/Seeding Costs		*$3,633*
	Total Access Road Reclamation Costs		**$12,385**

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Miscellaneous Site Reclamation					
II.	**Wastewater Pipeline Reclamation**				
	Assumptions				
		Pipeline Removal Rate (ft./man-day)			67
		Pipeline Shredding Rate (ft./man-day)			67
		Number of Pond Pipelines			2
		Length of Pond Pipelines (ft)			2,000
		Number of RO Building Pipelines			4
		Length of RO Building Pipelines (ft)			300
		Average Pipe Size (Sch 40)			4
	A.	Pipeline Removal Costs			
		Length of Pipelines (ft)			5,200
		Removal Rate (ft/man-day)			67
		Removal Labor Rate ($/hr)			$120
		IT12 Loader Use (days)			5
		IT12 Loader Cost			$1,813
		Subtotal Pipeline Removal Costs			*$11,139*
	B.	Pipeline Shredding Costs			
		Length of Pipelines (ft)			5,200
		Shredding Rate (ft/man-day)			67
		Shredding Labor Rate ($/hr)			$120
		Shredder Use (days)			5
		Shredder Cost			$480
		Subtotal Pipeline Shredding Costs			*$9,326*

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Miscellaneous Site Reclamation			
	C.	Pipeline Transportation and Disposal (NRC-Licensed Facility)	
		Pipe Diameter (inches)	4
		Chipped Volume Reduction (ft^3/ft)	0.0103
		Subtotal Volume of Shredded PVC Pipe (yd^3)	2.0
		Disposal Void Factor	1.25
		Final Disposal Volume (yd3)	2.5
		Transportation and Disposal Unit Cost ($/$yd^3$)	$149.30
		Subtotal Pipeline Disposal Costs	*$370*
	Total Wastewater Pipeline Reclamation Costs		**$20,836**
III.	**Electrical Distribution System Removal**		
		Assumptions	
		Length of High Voltage Lines	9,000
		High Voltage Line Removal Rate ($/ft.)	$0.59
		High Voltage Line Removal Cost ($/ft.)	$5,310
		Substation Removal	$1,175
		Subtotal Pipeline Removal Costs	**$6,485**
IV.	**Supervisory Labor Costs During Pond Reclamation**		
		Estimated Duration (months)	3
		Engineer Rate ($/month)	$6,677
		Total Engineer Labor	$20,030
		Radiation Technician Rate ($/month)	$5,563
		Total Radiation Tecnician Labor	$16,688
	Total Supervisory Labor Costs		**$36,718**
TOTAL MISCELLANEOUS RECLAMATION COSTS			**$76,424**

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Deep Disposal Well Reclamation				
I.	**Cost Basis**			
	A.	Plugging and Abandonment		
		Cost Estimate from June 1996 for plugging and abandonment		$59,026
		June 1996 CPI		156.7
		June 2001 CPI		178.0
		Subtotal Escalated 2001 Plugging and Abandonment Costs		*$67,049*
	B.	Site Reclamation		
		Cost Estimate from June 1996 for reclamation		$2,346
		June 1996 CPI		156.7
		June 2001 CPI		178.0
		Subtotal Escalated 2001 Reclamation Costs		*$2,665*
TOTAL MISCELLANEOUS RECLAMATION COSTS				**$69,714**

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I-196 Brule Aquifer Restoration				
I.	**Ground Water Sweep Costs**			
	Assumptions			
	PV's Required from I-196a, I-196j and I-196n			3
	Total Gallons per Pore Volume			337,758
	Total Gallons to Treat			1,013,274
	Flow Rate (gpm)			3
	Pump Power Requirements (kw)			3
	Power Cost ($/kw)			$0.05
	Pumping Labor (man-day per day)			0.13
	Sampling Labor (man-day per day)			0.07
	Labor Rate ($/man-day)			$120
	Days to complete			235
	A. Electrical Costs			
	Cost to pump 3 Pore Volumes			*$844*
	B. Labor Costs			
	Labor for pumping 3 Pore Volumes			*$3,648*
Total Ground Water Sweep Costs				**$4,492**
II.	**Monitoring and Sampling Costs**			
	A. Labor Costs for Monitoring			$2,004
	B. Monitoring for I-196i, I-196m, and I-196l			$2,004
Total Monitoring and Sampling Costs				**$4,008**

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I-196 Brule Aquifer Restoration					
III	**Additional Ground Water Sweep**				
		Pump from additional wells and monitor as above			$8,501
		Drill 4 additional wells, 50 ft deep at $26/ft.			$5,200
Total Additional Ground Water Sweep					**$13,701**
IV	**Well Abandonment**				
		Abandon 14 wells at $194/well			$2,716
Total Well Abandonment					**$2,716**
TOTAL I-196 BRULE AQUIFER RESTORATION COSTS					**$24,917**

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GROUNDWATER RESTORATION

GROUNDWATER SWEEP (GWS) Unit Costs

Assumptions:

1.	All pumps are 5 hp pumping at 32 gpm		
2.	Cost of electricity =	$0.05	Kw hr
3.	Horsepower to kilowatt conversion =	0.746	Kw/HP
4.	Operator labor costs =	$119.63	man-day
5	Labor costs are based on 36 pumps at 1,150 gpm		

Wellfield Pumping Electrical Costs per 1000 Gallons

	1000	gal	X	5	hp	X	1	hr	X	0.746	kwh	X	$	0.05	= $	0.097135417	
				32	gpm		60	min		hp				kwh			

Wellfield Pumping Labor Costs per 1000 Gallons

	1000	gal	X		min	X	8	hr	X	$120		X	2	operators	= $	$0.4334	
				115	gal		480	min		man-day							

TOTAL GWS COSTS PER 1000 GALLONS	**= $**	**0.5306**

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Groundwater Reverse Osmosis (RO) Treatment Unit Costs																		
Assumptions:																		
1.	All pumps are 5 hp pumping at 32 gpm																	
2.	Cost of electricity =																$0.05	Kw hr
3.	Horsepower to kilowatt conversion =																0.746	Kw/HP
4.	Operator labor costs =																$119.63	man-day
5.	RO System horsepower requirements for 400 gpm rated flow based upon:																	
				Injection Pump			25	hp										
				RO Unit Pump			164	hp										
				Permeate pump			40	hp										
				Waste pump			8	hp										
				TOTAL:			237	hp										
6.	Chemical costs:																	
				Reductant =													$0.284	lb
				Antiscalant =													$16.50	gal
Wellfield Pumping Electrical Costs per 1000 Gallons																		
	1000	gal	X	5	hp	X	1	hr	X	0.746	kwh	X	$	0.05		= $	0.097135417	per Kgal
				32	gpm		60	min		hp				kwh				
Wellfield Injection Electrical Costs per 1000 Gallons																		
	1000	gal	X	25	hp	X	1	hr	X	0.746	kwh	X	$	0.05		= $	0.038854167	per Kgal
				400	gpm		60	min		hp				kwh				
Reverse Osmosis Electrical Costs per 1000 Gallons																		
	1000	gal	X	212	hp	X	1	hr	X	0.746	kwh	X	$	0.05		= $	0.329483333	per Kgal
				400	gpm		60	min		hp				kwh				
Reverse Osmosis Labor Costs per 1000 Gallons																		
	1000	gal	X	1	min	X	1	man-day	X	$120		X		2	operators	= $	$1.2461	per Kgal
				400	gal		480	min		man-day								
Treatment chemical costs per 1000 Gallons																		
	Antiscalant:																	
	1000	gal	X	8.33E-0	gal antiscalant	X	$16.50									= $	$0.14	per Kgal
				1	gal		gal antiscalant											
	Reductant:																	
	1000	gal	X	5.60E-0	lbs reductant	X	$0.284									= $	$0.16	per Kgal
				1	gal		lb reductant											
TOTAL RO COSTS PER 1000 GALLONS														**= $**	**2.008**			

Groundwater Recirculation Unit Costs																		
Assumptions:																		
1.	All pumps are 5 hp pumping at 32 gpm																	
2.	Cost of electricity =																$0.05	Kw hr
3.	Horsepower to kilowatt conversion =																0.746	Kw/HP
4.	Operator labor costs =																$119.63	man-day
5.	System horsepower requirements for 1,150 gpm rated flow based upon:																	
				injection pump				30	hp									
6.	Chemical costs:																	
				Reductant =													$0.284	lb
Wellfield Pumping Electrical Costs per 1000 Gallons																		
	1000	gal	X	5	hp	X	1	hr	X	0.746	kwh	X	$	0.05		= $	0.097135417	per Kgal
				32	gpm		60	min		hp				kwh				
Wellfield Injection Electrical Costs per 1000 Gallons																		
	1000	gal	X	30	hp	X	1	hr	X	0.746	kwh	X	$	0.05		= $	0.016217391	per Kgal
				1150	gpm		60	min		hp				kwh				
Recirculation Labor Costs per 1000 Gallons																		
	1000	gal	X	1	min	X	1	man-day	X	$120		X		2	operators	= $	$0.4334	per Kgal
				1150	gal		480	min		man-day								
Treatment chemical costs per 1000 Gallons																		
	Reductant:																	
	1000	gal	X	5.60E-04	lbs reductant	X	$0.284									= $	$0.159	per Kgal
				1	gal		lb reductant											
TOTAL RECIRCULATION COSTS PER 1000 GALLONS														= $	**0.706**			

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WELL ABANDONMENT Unit Costs															
Assumptions:															
1	Use backhoe for 0.5 hr/well to dig and reclaim pit.														
2	Mixing unit is used to pump plug gel into well at 2 hours per well.														
3	Labor for pulling hoses, running cementer, inserting plug gel, etc. will require 2 workers at 2 hrs per well														
Well Abandonment Costs												**Cost per ft (based on 700 ft wells)**			
	Backhoe														
		0.5	hours	X	$	45.32	per hour		=$	22.66		$0.0324			
	Mixing unit														
		2	hours	X	$	12.00	per hour		=$	24.00		$0.0343			
	Labor														
		4	man	X	$	14.95	per man		=$	59.81		$0.0854			
			hours				hour								
	Well Cap	1	each	X	$	10.3129	each		=$	10.31		$0.0147			
Materials per foot of well (Variable Cost)															
	Cement	0.81	lbs/ft	X	$	103.129	per ton		=$			$0.0418			
	Bentonite	0.065	lbs/ft	X	$	195.944	per ton		=$			$0.0064			
	Salt	0.047	lbs/ft	X	$	57.752	per ton		=$			$0.0014			
	Plug Gel	0.01	sacks/ft	X	$	6.91	per sack		=$			$0.0691			
Total Estimated Cost per Foot:												**$0.2854**			

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Master Cost Basis

Mine Unit Data

		Mine Unit 1	Mine Unit 2	Mine Unit 3	Mine Unit 4	Mine Unit 5	Mine Unit 6	Mine Unit 7	Mine Unit 8	Mine Unit 9
Total number of production wells		38	52	57	96	189	194	179	140	0
Total nomber of injection wells		72	79	96	169	219	293	300	240	0
Total number of shallow monitor wells		3	3	3	11	25	28	25	30	30
Total number of perimeter monitor wells		11	10	10	18	27	32	16	25	30
Total number of restoration wells		10	12	18	43	33	33	46	25	30
Wellfield Area (ft2)		403712	509600	586188	1033440	1385181	1567768	1904560	1400000	0
Wellfield Area (acres)		9.27	11.70	13.46	23.72	31.80	35.99	43.72	32.14	0.00
Affected Ore Zone Area (ft2)		403712	509600	586188	1033440	1385181	1567768	1904560	1400000	0
Avg. Completed Thickness		19.6	16.3	12.5	12.9	14.5	15.4	12 6	15	15
Porosity		0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Affected Volume (ft3)		7912755.2	8306480	7327350	13331376	20085124.5	24143627.2	23997456	21000000	0
Kgallons per Pore Volume		17164.349	18018.416	15894.488	28918.421	43568.652	52372.356	52055.282	45553.200	0.000
Number of Patterns in Unit(s)										
	Current	38	52	57	96	187	187	200	50	0
	Estimated next repor	0	0	0	0	2	7	-21	90	0
	Total Estimated	38	52	57	96	189	194	179	140	0
Number of Wells in Unit(s)										
Production Wells										
	Current	38	52	57	96	187	187	200	30	0
	Estimated next repor	0	0	0	0	2	7	-21	110	0
	Total Estimated	38	52	57	96	189	194	179	140	0
Injection Wells										
	Current	72	79	96	169	221	309	325	50	0
	Estimated next repor	0	0	0	0	-2	-16	-25	190	0
	Total Estimated	72	79	96	169	219	293	300	240	0
Shallow Monitor Wells										
	Current	3	3	3	11	25	28	25	25	0
	Estimated next repor	0	0	0	0	0	0	0	5	30
	Total Estimated	3	3	3	11	25	28	25	30	30
Perimeter Monitor Wells										
	Current	11	10	10	18	27	32	16	30	0
	Estimated next repor	0	0	0	0	0	0	0	-5	30
	Total Estimated	11	10	10	18	27	32	16	25	30
	Estimated next repor	0	0	0	0	0	0	0	-5	30
	Total Estimated	11	10	10	18	27	32	16	25	30
Number of Wells per Wellfield		124	144	166	294	460	547	520	435	60
Total Number of Wells		2690								
Average Well Depth (ft)		665	631	774	698	675	515	762	500	770

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Electrical Costs			
		2002 Est Rate	
Power cost		$0.05	kwHr
Kilowatt to Horsepower		0.746	Kw/HP
Horsepower per gallon per minute		0.167	HP/gpm

Labor Rates			
	200[illegible] Rate	2002 Est Rate	
Operator Labor Cost	$[illegible]00	$119.63	day
Engineer Cost	$6.[illegible]4.00	$6,676.55	month
Radiation Technician Costs	$5.[illegible]4.00	$5,562.76	month

Chemical Costs			
	200[illegible] Rate	2002 Est Rate	
Antiscalant for RO	$1[illegible].00	$16.50	gal
Reductant	$0.[illegible]75	$0.28	lb
Cement	$1[illegible].00	$103.13	ton
Bentonite	$1[illegible].00	$195.94	ton
Salt	$5[illegible].00	$57.75	ton
Plug Gel	$[illegible]70	$6.91	sack
Well Cap	$[illegible].00	$10.31	each
Hydrochloric Acid	$[illegible]64	$0.66	gallon

Analytical Costs			
Guideline 8 (contract lab)		$130.00	analysis
6 parameter (in-house)		$47.00	analysis
Other (radon, bio, etc.)		$806.00	month

Spare Parts			
	200[illegible] Rate	2002 Est Rate	
Restoration spare parts estimate	$16.[illegible]7.00	$17,322.51	year

CPI Escalators (CPI-U, U.S. City Average)	
1988 CPI (average)	[illegible]18.3
June 1991 CPI (deep well estimate)	[illegible]56.7
2000 CPI (July 2000)	[illegible]72.6
Current CPI (June 2001)	[illegible]78.0
2002 Escalation Factor	1.031

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Master Cost Basis

Equipment Costs

Equipment	Base Rental Rate ($/hr)	Labor Costs ($/hr)	Operating Costs ($/hr)	Fuel Costs ($/hr)	Mob & Demob ($/hr)	Total ($/hr)
IT 12 Loader	16.00	14.00	9.00	4.32	2.00	45.32
Backhoe	16.00	14.00	9.00	4.32	2.00	45.32
Shredder	12.00			inc	inc	12.00
D8N Bulldozer	88.00	14.00	19.00	13.00	2.00	136.00
Smeal	42.00	inc	inc	inc	inc	42.00
Mixing Unit	12.00			inc	inc	12.00

Basis: IT12 and D8N rental rates from Nebraska Machinery; others estimated.
Current diesel cost from Caterpillar Handbook, Edition 19, with current costs of $1.08/gal.
Mob/Demob based on $2.08/mi at 90 miles one way x 2 trips/176 hours

Pipe Volumes

Nominal Pipe Size	Wall Thickness (in.)	Pipe OD (in.)	Volume per foot (ft3/ft)
3/8-inch O2 hose		0.37500	0.03130
2-inch Sch. 40 downhole	0.15400	2.37500	0.00740
1-1/4-inch Sch. 40 stinger	0.14000	1.66000	0.00440
2-inch SDR 13.5 inj & prod.	0.14815	2.29630	0.00690
4-inch SDR 35	0.11430	4.22860	0.01030
6-inch Sch. 40 process pipe	0.28000	6.56000	0.03840
6-inch Trunkline	0.49100	6.56600	0.06510
8-inch Trunkline	0.63900	8.54800	0.11030
10-inch Trunkline	0.79600	10.65400	0.17120
12-inch Trunkline	0.94400	12.63700	0.24080

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Pipe Removal and Shredding Costs

Activity	*Removal Rate (ft/man-day)*	*Shredding Rate (ft/man-day)*	*Labor Rate (day)*	*Activity Cost per foot*
2-inch SDR 13.5 inj & prod. Removal	225		$120	$0.532
2-inch SDR 13.5 inj & prod. Shredding		225	$120	$0.532
Trunkline Removal	100		$120	$1.196
Trunkline Shredding		100	$120	$1.196
Downhole Pipe Removal	2000		$120	$0.060
Downhole Pipe Shredding		2250	$120	$0.053
Downhole Hose Removal	1000		$120	$0.120
Waste and RO Building Pipeline Removal	67		$120	$1.794
Waste and RO Building Pipeline Shredding		67	$120	$1.794

Waste Disposal Costs

Waste Form	*Fee*		*Transport Cost*		*Total Transportation and Disposal*	
Soil, Bulk Byproduct Material	$81.00	per Yd3	$68.30	per Yd3	$149.30	per Yd3
Solid Waste (landfill)	$0.00925	per Lb	Incl.	per Lb	$0.00925	per Lb
Solid Waste (landfill)	$370.00	per Load	Incl.	per Load	$370.00	per Load
Void Factor (for disposal)	1.25					

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Master Cost Basis

Plant Dismantling							
Plant Components:	*Number*	*Units*	*Estimated Disposal Volume*	*Units*	*Activity*	*Units*	*1988 Cost*
Contaminated Tanks	27	each	19.3	Ft3 each	Dismantle interior steel, tanks, piping and electrical:	$	$66,600
Uncontaminated Tanks	7	each	19.3	Ft3 each	Dismantle Plant Building	$	$43,800
Pumps	30	each	5	Ft3 each			
Downhole Pumps	350	each	0.5	Ft3 each	Concrete floor removal rate	$/ft2	$2.72
Contaminated Piping	4125	feet	See estimate by piping size and material				
Uncontaminated Piping	4125	feet					
Filters	4	each	100	Ft3 each			
Dryer	1	each	400	Ft3 each			
Average PVC Pipe Diameter (inches)	6						

Plant Decontamination				
Direct Dispose Plant Floor Area	5450 ft2	Decon Solution (HCl) Floor Application Rate	2	gal/ft2
Uncontaminated Plant Floor Area	7000 ft2			
Decontaminated Plant Floor Area	17530 ft2			
Average concrete thickness	0.5 ft			
Plant Wall Area	24000 ft2	Decon Solution (HCl) Wall Application Rate	1	gal/ft2