

**HRI Unit 1  
Wellfield Equipment Tabulation**

# H. Houses	FULMW	FOLMW	SOLMW	DMW	# Injectors	# Extractors	# Feet 2"	# Feet 10"	# Feet 14"	Gravel Road
1					16	20	6300	520		
2					28	29	13720	1320		
3					25	21	8380	1160		
4					12	20	7080	600		
5					31	26	12390	0		
6					24	33	13840	0		
7					27	21	10980	680		
8					23	25	8800	560		
9					23	24	10100	1200		
10					22	18	8300	880		
11					24	23	9300	1200		
12					13	9	5960	1000		
13					27	26	10800	800		
14					13	14	5960	640		
Totals					295	295	125950	9920	9600	5000

Total wellfield acreage      102

## Pipe Wall Volume Data

<u>Outside Diameter (in)</u>	<u>Area Inside OD (ft2)</u>	<u>Wall Volume SDR17 (ft3/ft)</u>
2	0.022	0.012
2.5	0.034	
3	0.049	0.018
3.5	0.067	
4	0.087	
4.5	0.110	
5	0.136	
5.5	0.165	
6	0.196	
6.5	0.230	
7	0.267	
7.5	0.307	
8	0.349	
8.5	0.394	
9	0.442	
9.486	0.491	
9.5	0.492	
10	0.545	0.140
10.5	0.601	
10.75	0.630	
11	0.660	
11.5	0.721	
12	0.785	
12.353	0.832	
12.5	0.852	
13	0.922	
13.5	0.994	
14	1.069	0.237
14.5	1.147	
15	1.227	
15.5	1.310	
Wall Tk		
14 " SDR 17		0.824
10 " SDR 17		0.632

**PROGRAM TO CALCULATE THE VOLUME CONTAINED WITHIN  
A RECTANGULAR POND WITH KNOWN SLOPE AND DEPTH**

ALL DIMENSIONS ARE IN FEET

THE TOP OF THE POND MEASUREMENTS ARE:

LENGTH	350
WIDTH	350
DEPTH	20
SLOPE	3

W= BOTTOM WIDTH	230
L= BOTTOM LENGTH	230

DEPTH	GALLONS	CUBIC FEET	CUBIC YARDS
0.50	200,438	26,797	992
1.00	406,104	54,292	2,011
1.50	617,066	82,496	3,055
2.00	833,392	111,416	4,127
2.50	1,055,148	141,063	5,225
3.00	1,282,401	171,444	6,350
3.50	1,515,220	202,570	7,503
4.00	1,753,671	234,448	8,683
4.50	1,997,822	267,089	9,892
5.00	2,247,740	300,500	11,130
5.50	2,503,492	334,692	12,396
6.00	2,765,147	369,672	13,692
6.50	3,032,770	405,451	15,017
7.00	3,306,429	442,036	16,372
7.50	3,586,193	479,438	17,757
8.00	3,872,127	517,664	19,173
8.50	4,164,299	556,725	20,619
9.00	4,462,777	596,628	22,097
9.50	4,767,629	637,384	23,607
10.00	5,078,920	679,000	25,148

Liner Size	375X375
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**PROGRAM TO CALCULATE THE VOLUME CONTAINED WITHIN  
A RECTANGULAR POND WITH KNOWN SLOPE AND DEPTH**

ALL DIMENSIONS ARE IN FEET

THE TOP OF THE POND MEASUREMENTS ARE:

LENGTH	120
WIDTH	120
DEPTH	10
SLOPE	3

W= BOTTOM WIDTH	60
L= BOTTOM LENGTH	60

DEPTH	GALLONS	CUBIC FEET	CUBIC YARDS
0.50	14,148	1,892	70
1.00	29,711	3,972	147
1.50	46,754	6,251	232
2.00	65,345	8,736	324
2.50	85,553	11,438	424
3.00	107,443	14,364	532
3.50	131,083	17,525	649
4.00	156,541	20,928	775
4.50	183,885	24,584	911
5.00	213,180	28,500	1,056
5.50	244,495	32,687	1,211
6.00	277,897	37,152	1,376
6.50	313,453	41,906	1,552
7.00	351,231	46,956	1,739
7.50	391,298	52,313	1,938
8.00	433,720	57,984	2,148
8.50	478,567	63,980	2,370
9.00	525,904	70,308	2,604
9.50	575,799	76,979	2,851
10.00	628,320	84,000	3,111

September 14, 2001

Liner Size

150X150

## Ground Water Restoration

PV Assumptions - 9 pore volumes required pursuant to license condition 9.5

ZONE	Area (ft2)	Tk (ft)	Vol (ft3)	Por	gal/ft3	PV (gal)	H-PIF	V-PIF	CPV (gal)	9 X CPV
UUA	467,500	8	3,740,000	0.25	7.48	6,993,800	1.5	1.3	13,637,910	122,741,190
UA	675,000	8	5,400,000	0.25	7.48	10,098,000	1.5	1.3	19,691,100	177,219,900
LA	817,000	8	6,536,000	0.25	7.48	12,222,320	1.5	1.3	23,833,524	214,501,716
UB	1,012,500	8	8,100,000	0.25	7.48	15,147,000	1.5	1.3	29,536,650	265,829,850
ULB	1,245,000	8	9,960,000	0.25	7.48	18,625,200	1.5	1.3	36,319,140	326,872,260
LB	452,500	8	3,620,000	0.25	7.48	6,769,400	1.5	1.3	13,200,330	118,802,970
UUC	515,000	8	4,120,000	0.25	7.48	7,704,400	1.5	1.3	15,023,580	135,212,220
UC	335,000	8	2,680,000	0.25	7.48	5,011,600	1.5	1.3	9,772,620	87,953,580
MC	290,000	8	2,320,000	0.25	7.48	4,338,400	1.5	1.3	8,459,880	76,138,920
LC	172,000	8	1,376,000	0.25	7.48	2,573,120	1.5	1.3	5,017,584	45,158,256
TOTALS	5,981,500		47,852,000			89,483,240			174,492,318	1,570,430,862

Area - Area of cut off grade mineralization  
Tk - Thickness of cut off grade mineralization  
Por - Estimated porosity of the rock  
PV - Straight pore volume without any correction  
H-PIF - Horizontal pore volume increase factor  
V-PIF - Vertical pore volume increase factor  
CPV - Corrected pore volume

## MAIN PIPELINE REMOVAL

### Assumptions:

1. Trenching with trackhoe at 1,500 ft/day
2. Pipeline extraction and backfilling with trackhoe at 1500 ft/day
3. Trackhoe rental: \$1600/week
4. Fuel cost: \$9/operating hour
5. Trackhoe operation requires one worker at \$15/hour
6. Pipeline extraction requires 2 workers at \$15/hour (in addition to trackhoe operator)
7. Pipelines removed simultaneously
8. Includes removal of manholes
9. Operating schedule: 8 hours/day, 5 days/week

### Main Pipeline Removal Costs per ft of Pipe

#### Equipment & Fuel

	<u>Weekly</u>	<u>Daily</u>	<u>Hourly</u>	<u>Per Foot</u>
Trackhoe	\$1,200.00	\$240.00	\$30.00	\$0.16
Fuel		\$72.00	\$9.00	\$0.05

#### Labor

Trackhoe operator		\$120.00	\$15.00	\$0.08
Pipeline extractors (2)		\$240.00	\$30.00	\$0.16

<b>Total Per Foot Cost</b>				<b>\$0.45</b>
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## WELLFIELD PIPING REMOVAL

### Assumptions:

1. Trenching with backhoe at 1500 ft/day
2. Pipeline extraction and backfilling with backhoe at 1500 ft/day
3. Backhoe rental: \$750/week
4. Fuel cost: \$9/operating hour
5. Backhoe operation requires 1 worker at \$15/hour
6. Pipeline extraction requires 2 workers at \$15/hour (in addition to backhoe operator)
7. Operating schedule: 8 hrs/day, 5 days/week

### Wellfield Pipeline Removal Costs per ft of Pipe

#### Equipment & Fuel

	<u>Weekly</u>	<u>Daily</u>	<u>Hourly</u>	<u>Per Foot</u>
Backhoe	\$550.00	\$110.00	\$13.75	\$0.07
Fuel		\$72.00	\$9.00	\$0.05

#### Labor

Backhoe operator		\$120.00	\$15.00	\$0.08
Pipeline extractors (2)		\$240.00	\$30.00	\$0.16

Totals			\$67.75	
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<b>Total Per Foot Cost</b>				<b>\$0.36</b>
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**WELLFIELD ROAD RECLAMATION****Assumptions:**

1. Gravel road base removed at cost of \$0.60/cy/1000 ft (WDEQ Guideline No. 12, Appendix C)
2. Gravel road base: average depth = 0.5 ft, average width = 15 ft
3. Roads scarified prior to topsoil application at cost of \$30.51/acre (WDEQ Guideline No. 12, Appendix P)
4. Grading of scarified roads prior to topsoil application at cost of \$33.27/acre (WDEQ Guideline No. 12, Appendix G)
5. Topsoil applied at cost of \$0.60/cy/1000 ft (WDEQ Guideline No. 12, Appendix C, surface grade: level ground)
6. Stripped topsoil: average depth = 0.67 ft, average width = 25 ft
7. Discing/seeding cost of \$200/acre

**Costs per 1000 ft of road**

	<u>Width (ft)</u>	<u>Thick (ft.)</u>	<u>Yd3</u>	<u>\$/Yd3</u>	<u>Total</u>
Road base removal	15	0.5	278	\$0.60	\$166.67
Topsoil application	25	0.67	620	\$0.60	\$372.22

	<u>Width (ft)</u>	<u>Acres</u>	<u>\$/Acres</u>	<u>Total</u>
Scarification	25	0.6	\$30.51	\$17.51
Grading	25	0.6	\$33.27	\$19.09
Disking/seeding	25	0.6	\$200.00	\$114.78

<b>TOTAL WELLFIELD ROAD RECLAMATION</b>				<u><b>\$690.28</b></u>
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**DISKING/SEEDING**

Assumption:

1. Based on actual contractor costs

TOTAL DISKING/SEEDING COSTS PER ACRE     =     \$200.00

## TRANSPORTATION AND DISPOSAL

### 11.e.2 By-Product Material Transportation Disposal Costs per Ft3

**Assumptions:**

1. Based on contract costs for transportation to and disposal at the IUC White Mesa Mill near Blanding Utah
2. Transportation assumed a 200 mile trip at \$4.76 per mile, \$952 per trip. Bulk truck capacity 30 yds<sup>3</sup>. Drum truck capacity 64 yds<sup>3</sup>.
3. All 11.e.2 disposal fees are based upon actual current contract rates at Texas ISR facilities as itemized in 4 & 5 below
4. Drummed waste. \$2,866 per shipment of 64 drums, 7.35 cu. ft. per drum, \$6.09 per cubic foot.
5. Bulk waste. \$1975.45 per shipment of 30 cu. yds. , \$2.44 per cu. ft.
6. Per truck site unloading (\$135.00) and decontamination (\$150.00) amounts are specified in URI's current disposal site

Type of Waste: Sludge, resin, and other by-product type wastes shipped in drums.

	<u>Unit Shipment</u>			
	<u>Cost</u>	<u>Units/Drum</u>	<u>Drums/Truck</u>	<u>Total \$/ft3</u>
Disposal fee	\$2,866.00	7.35	64	\$6.09
Shipping	\$952.00			\$2.02
Site unloading	\$135.00			\$0.28
Site scanning	\$150.00			\$0.31
Total shipping and disposal				\$8.71

Type of waste: Soil, sand, demolished concrete and other bulk wastes

	<u>Unit Shipment</u>			
	<u>Cost</u>		<u>Ft3/Truck</u>	<u>Total \$/ft3</u>
Disposal fee	\$1,975.45		810	\$2.44
Shipping	\$952.00		810	\$1.18
Site unloading	\$45.00		810	\$0.06
Site scanning	\$150.00		810	\$0.19
Total shipping and disposal				\$3.85

### Unrestricted Material Transportation Disposal Costs per ton

**Assumptions:**

1. Based on public costs disposal at the Waste Management Red Rocks Landfill. 24 \$/ton
2. 1 ton is equal to 1 yd<sup>3</sup>
2. Transportation assumed a 30 mile trip at \$2.00 per mile. Bulk truck capacity 20 yds<sup>3</sup>.

	<u>Unit Cost</u>	<u>Total \$/yds3</u>
Disposal fee (ton)	\$24.00	\$24.00
Shipping (truck trip)	\$60.00	\$3.00
Total shipping and disposal (yd3)		\$27.00

	A	B	C	D	E	F	G	H	I	J
1	September 14, 2001									
2	<b>LABOR SUMMARIES</b>									
3										
4										
5										
6						<b>Number</b>	<b>Hourly Rate</b>	<b>Yearly Salary</b>	<b>Annual</b>	<b>Monthly</b>
7										
8	<b>Management and Accounting</b>									
9	Salaried	Operations Manager				1	-	\$120,000	\$120,000	\$10,000
10	Salaried	Environmental Manager				1	-	\$105,000	\$105,000	\$8,750
11	Salaried	Accounting Manager						\$105,000	\$105,000	\$8,750
12	Salaried	Accountant					-	\$65,000	\$65,000	\$5,417
13	<b>Plant Personnel</b>									
14	Salaried	Plant Superintendent					-	\$85,000	\$85,000	\$7,083
15	Salaried	Plant Engineer					-	\$45,000	\$45,000	\$3,750
16	Salaried	Radiation Officer				1	-	\$30,000	\$30,000	\$2,500
17	Salaried	Chemist				1	-	\$46,000	\$46,000	\$3,833
18	Salaried	Plant Foreman					-	\$28,000	\$28,000	\$2,333
19	Salaried	Maintenance Foreman					-	\$28,000	\$28,000	\$2,333
20	Wage	Lab Technicans					\$9.62	-	\$20,010	\$1,667
21	Wage	Secretary					\$9.62	-	\$20,010	\$1,667
22	Wage	Electrician				1	\$14.43	-	\$30,014	\$2,501
23	Wage	Apprentice Electrician					\$12.01	-	\$24,981	\$2,082
24	Wage	Plant Operator				1	\$11.54	-	\$24,003	\$2,000
25	Wage	Assistance Plant Operator					\$11.54	-	\$24,003	\$2,000
26	Wage	Dryer Operator					\$11.54	-	\$24,003	\$2,000
27	Wage	Maintenance					\$11.54	-	\$24,003	\$2,000
28	<b>Wellfield Personnel</b>									
29	Salaried	Wellfield Superintendent					-	\$41,200	\$41,200	\$3,433
30	Salaried	Drilling Engineer					-	\$40,500	\$40,500	\$3,375
31	Salaried	Foreman				1	-	\$28,000	\$28,000	\$2,333
32	Wage	Truck Driver				1	\$11.54	-	\$24,003	\$2,000
33	Wage	Electrician					\$14.43	-	\$30,014	\$2,501
34	Salaried	Data Entry Clerk					-	\$20,000	\$20,000	\$1,667
35	Wage	Secretary						\$20,000	\$20,000	\$1,667
36	Wage	Logger					\$12.01	-	\$24,981	\$2,082
37	Wage	Wellfield Operators				1	\$11.50	-	\$23,920	\$1,993
38	Wage	Assistant Wellfield Operator					\$11.50	-	\$23,920	\$1,993
39	Wage	Balancer					\$11.50	-	\$23,920	\$1,993
40	Wage	Environmental Sampler					\$11.50	-	\$23,920	\$1,993
41	Wage	Pump Hoist Operators				1	\$11.50	-	\$23,920	\$1,993
42	Wage	Backhoe Operator					\$10.49	-	\$21,819	\$1,818
43	Wage	Maintenance					\$11.50	-	\$23,920	\$1,993
44	Wage	Casing Crew					\$11.50	-	\$23,920	\$1,993
45	<b>Engineering &amp; Geologic Personnel</b>									
46	Salaried	Chief Engineer					-	\$66,000	\$66,000	\$5,500
47	Salaried	RESERVOIR ENGINEER					-	\$60,000	\$60,000	\$5,000
48	Salaried	Senior Geologist				1	-	\$58,000	\$58,000	\$4,833
49	Salaried	Geologist					-	\$48,800	\$48,800	\$4,067
50	Salaried	Logging Supervisor					-	\$35,000	\$35,000	\$2,917
51	Wage	Secretary						\$20,000	\$20,000	\$1,667
52	Wage	Surveyor					\$12.02	-	\$25,002	\$2,083
53	Wage	Assistant Surveyor					\$12.02	-	\$25,002	\$2,083
54	Wage	Logger					\$10.49	-	\$21,819	\$1,818
55										
56	Total #					11				

**Calculation of BC Solids Produced**

Flow (g/min)	580
Flow (l/min)	2,195
Flow (l/d)	3,161,232
Solids (g/l)	4
Solids (g/d)	12,644,928
Solids (g/mo)	384,616,560
Solids (kg/mo)	384,617
Solids (lb/mo)	174,429
Solids (yd <sup>3</sup> /mo)*	87
Solids (ft <sup>3</sup> /mo)	2,355
Unit disposal cost (\$/ft <sup>3</sup> )	#REF!
Monthly disposal cost (\$)	#REF!

\*1 yd<sup>3</sup> ~ 1 ton

**UNIT 1GROUNDWATER RESTORATION AND DECOMMISSIONING COSTS**  
**COSTS ASSOCIATED WITH RO AND BRINE CONCENTRATION OPERATION AND MAINTENANCE**

September 14, 2001

	Period	1/4	2/4	3/4	4/4	5/4	6/4	7/4	8/4	9/4	10/4	11/4	12/4
1 <b>Management and Accounting</b>													
2 Operations Manager		1	1	1	1	1	1	1	1	1	1	1	1
3 Environmental Manager		1	1	1	1	1	1	1	1	1	1	1	1
4 <b>Plant Personnel</b>													
5 Radiation Officer		1	1	1	1	1	1	1	1	1	1	1	1
6 Chemist		1	1	1	1	1	1	1	1	1	1	1	1
7 Electrician		1	1	1	1	1	1	1	1	1	1	1	1
8 Plant Operator		1	1	1	1	1	1	1	1	1	1	1	1
9 <b>Wellfield Personnel</b>													
10 Foreman		1	1	1	1	1	1	1	1	1	1	1	1
11 Truck Driver		1	1	1	1	1	1	1	1	1	1	1	1
12 Wellfield Operators		1	1	1	1	1	1	1	1	1	1	1	1
13 Pump Hoist Operators		1	1	1	1	1	1	1	1	1	1	1	1
14 <b>Engineering &amp; Geologic Personnel</b>													
15 Senior Geologist		1	1	1	1	1	1	1	1	1	1	1	1
16													
17 <b>Total Employees</b>		11	11	11	11	11	11	11	11	11	11	11	11
18													
19 <b>Operations Statistics</b>													
20 Reverse Osmosis Treatment													
21 GPM RO Capacity		580	580	580	580	580	580	580	580	580	580	580	580
22 GPM RO Product		464	464	464	464	464	464	464	464	464	464	464	464
23 GPM RO Reject		116	116	116	116	116	116	116	116	116	116	116	116
24 MM Gals. RO Processed - Month		25,891,200	24,220,800	25,891,200	25,056,000	25,891,200	25,056,000	25,891,200	25,891,200	25,056,000	25,891,200	25,056,000	25,891,200
25 MM Gals. RO Permiate - Month		20,712,960	19,376,640	20,712,960	20,044,800	20,712,960	20,044,800	20,712,960	20,712,960	20,044,800	20,712,960	20,044,800	20,712,960
26 MM Gals. RO Reject - Month		5,178,240	4,844,160	5,178,240	5,011,200	5,178,240	5,011,200	5,178,240	5,178,240	5,011,200	5,178,240	5,011,200	5,178,240
27 <b>Brine Concentration</b>													
28 GPM BC Capacity		125	125	125	125	125	125	125	125	125	125	125	125
29 GPM Distillate		113.5	113.5	113.5	113.5	113.5	113.5	113.5	113.5	113.5	113.5	113.5	113.5
30 GPM Brine		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
31 MM Gals. BC Capacity - Month		5,580,000	5,220,000	5,580,000	5,400,000	5,580,000	5,400,000	5,580,000	5,580,000	5,400,000	5,580,000	5,400,000	5,580,000
32 MM Gals. Distillate - Month		5,066,640	4,739,760	5,066,640	4,903,200	5,066,640	4,903,200	5,066,640	5,066,640	4,903,200	5,066,640	4,903,200	5,066,640
33 MM Gals. Brine - Month		111,600	104,400	111,600	108,000	111,600	108,000	111,600	111,600	108,000	111,600	108,000	111,600
34 <b>Process Results</b>													
35 Beginning Gallons (9 PV Eq.)		657,334,062	631,554,462	607,438,062	581,658,462	556,710,462	530,930,862	505,982,862	480,203,262	454,423,662	429,475,662	403,696,062	378,748,062
36 Beginning PV		3.77	3.62	3.48	3.33	3.19	3.04	2.90	2.75	2.60	2.46	2.31	2.17
37 Gallons Processes Month		25,779,600	24,116,400	25,779,600	24,948,000	25,779,600	24,948,000	25,779,600	25,779,600	24,948,000	25,779,600	24,948,000	25,779,600
38 PV Processed Month		0.15	0.14	0.15	0.14	0.15	0.14	0.15	0.15	0.14	0.15	0.14	0.15
39 Cumulative Gallons Processed		938,876,400	962,992,800	988,772,400	1,013,720,400	1,039,500,000	1,064,448,000	1,090,227,600	1,116,007,200	1,140,955,200	1,166,734,800	1,191,682,800	1,217,462,400
40 Cumulative PV Processed		5.38	5.52	5.67	5.81	5.96	6.10	6.25	6.40	6.54	6.69	6.83	6.98
41 Remaining Gallons to Process		631,554,462	607,438,062	581,658,462	556,710,462	530,930,862	505,982,862	480,203,262	454,423,662	429,475,662	403,696,062	378,748,062	352,968,462
42 Remaining PV to Process		3.62	3.48	3.33	3.19	3.04	2.90	2.75	2.60	2.46	2.31	2.17	2.02
43 <b>ESTIMATED COST DETAIL</b>													
44													
45 Description	W Restoration Operations	GW Restoration Operat											
46													
47 Salaries-Direct		\$32,250	\$32,250	\$32,250	\$32,250	\$32,250	\$32,250	\$32,250	\$32,250	\$32,250	\$32,250	\$32,250	\$32,250
48 Wages-Direct		\$10,487	\$10,487	\$10,487	\$10,487	\$10,487	\$10,487	\$10,487	\$10,487	\$10,487	\$10,487	\$10,487	\$10,487
49 Insurance-Workmans Compensation		\$1,368	\$1,368	\$1,368	\$1,368	\$1,368	\$1,368	\$1,368	\$1,368	\$1,368	\$1,368	\$1,368	\$1,368
50 Payroll Taxes		\$2,992	\$2,992	\$2,992	\$2,992	\$2,992	\$2,992	\$2,992	\$2,992	\$2,992	\$2,992	\$2,992	\$2,992
51 Medical Insurance		\$4,274	\$4,274	\$4,274	\$4,274	\$4,274	\$4,274	\$4,274	\$4,274	\$4,274	\$4,274	\$4,274	\$4,274
52 401K Contributions		\$1,068	\$1,068	\$1,068	\$1,068	\$1,068	\$1,068	\$1,068	\$1,068	\$1,068	\$1,068	\$1,068	\$1,068
53 Telephone/Telegraph		\$1,250	\$1,250	\$1,250	\$1,250	\$1,250	\$1,250	\$1,250	\$1,250	\$1,250	\$1,250	\$1,250	\$1,250
54 Postage/Freight		\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150
55 Copy Equipment		\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300
56 Other Equipment & Rental		\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200
57 Office Supplies		\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250
58 Office Equipment Maintenance		\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50
59 Data Processing		\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150
60 Maps		\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50
61 Drafting & Printing		\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50
62 Transportation - Air & Car		\$850	\$850	\$850	\$850	\$850	\$850	\$850	\$850	\$850	\$850	\$850	\$850
63 Meals & Entertainment		\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200
64 Misc. Travel Expense		\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300
65 Env-Depreciable Equipment		\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100
66 Env-Operational Analyses		\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
67 Environmental - Miscellaneous		\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200
68 Safety		\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250
69 Backhoe Maintenance		\$700	\$700	\$700	\$700	\$700	\$700	\$700	\$700	\$700	\$700	\$700	\$700
70 Misc. Chemicals		\$2,450	\$2,450	\$2,450	\$2,450	\$2,450	\$2,450	\$2,450	\$2,450	\$2,450	\$2,450	\$2,450	\$2,450
71 Utilities - Electric, Wellfield		\$12,053	\$12,053	\$12,053	\$12,053	\$12,053	\$12,053	\$12,053	\$12,053	\$12,053	\$12,053	\$12,053	\$12,053
72 Utilities - Electric, Brine Concentrator		\$32,850	\$32,850	\$32,850	\$32,850	\$32,850	\$32,850	\$32,850	\$32,850	\$32,850	\$32,850	\$32,850	\$32,850
73 Utilities - Electric, Plant and RO		\$5,896	\$5,896	\$5,896	\$5,896	\$5,896	\$5,896	\$5,896	\$5,896	\$5,896	\$5,896	\$5,896	\$5,896
74 Submersible Pumps		\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
75 Submersible Motors		\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
76 Field Piping & Valves		\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400
77 Meters		\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50
78 Misc. Field		\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100
79 Handtools		\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100
80 Plant Piping & Valves		\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200
81 Plant Brine Conc Inst.		\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50
82 Pumps		\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
83 Plant Electrical		\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100
84 Filters		\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100
85 Evaporation Ponds		\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50	\$50
86 Roads		\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100
87 Gas, Oil, Grease		\$1,150	\$1,150	\$1,150	\$1,150	\$1,150	\$1,150	\$1,150	\$1,150	\$1,150	\$1,150	\$1,150	\$1,150
88 Disposal - B.C. Solids	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
89 RO Unit		\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250
90 Lab Supplies		\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100
91 RO Membrane		\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
92 Field Equip. Repairs & Maint.		\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150
93 Vehicle Repairs & Maint.		\$550	\$550	\$550	\$550	\$550	\$550	\$550	\$550	\$550	\$550	\$550	\$550
94 Vehicles - Pickups		\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
95 Vehicles - Tractors & Trucks		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
96 Vehicles - Automobiles		\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
97													
98 Monthly Total	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
99 Cumulative Total	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
100 Period Days		31	29	31	30	31	30	31	31	30	31	30	31

**GROUND WATER RESTORATION Sampling**

	Units	Sub Total	Total
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## Assumptions:

Labor from staff  
 Routine monitoring is covered in the restoration budget  
 One baseline well sampled per acre of wellfield (40)  
 One sample taken before restoration starts  
 Baseline wells sampled once per year during restoration  
 Stability samples taken every 2 months for six months

<b>I Monitoring and sampling costs</b>			
<b>A.</b>	Restoration well sampling		
	Estimated restoration period (years)	5.16	
	1 Well Sampling prior to restoration start		
	# of wells	102	
	\$/sample	\$380	\$38,760
	2 Restoration progress sampling		
	# of wells	102	
	\$/sample	\$120	
	Samples/year	1	\$61,200
	<b>B. Stability</b>		
	Estimated stabilization period (months)	6	
	# of wells	102	
	Sample freq. mos.	2	
	\$/sample	\$380	
	Total		\$116,280
<b>Total monitoring and sampling costs</b>			<b>\$216,240</b>





1	Labor		
	Number of persons	3	
	Ft <sup>3</sup> /day	200	
	Number of days	5	
	\$/day/person	\$120	
	Total RO dismantling and loading cost	\$1,800	
E	Brine concentration equipment		
	BC (ft <sup>3</sup> )	4000	
1	Labor		
	Number of persons	3	
	Ft <sup>3</sup> /day	200	
	Number of days	20	
	\$/day/person	\$120	
	Total BC dismantling and loading cost	\$7,200	\$31,800
	Total process equipment removal and loading costs		
<b>II. Transportation and Disposal Costs (NRC-Licensed Facility)</b>			
A.	Tankage (plastic and fiberglass)		
	Volume of tank construction material (ft <sup>3</sup> )	1300	
	Volume of disposal assuming 50% void space (ft <sup>3</sup> )	1950	
	Transportation and disposal unit cost (\$/ft <sup>3</sup> )	<b>\$3.85</b>	
	Subtotal tankage transportation and disposal costs	<b>\$7,508</b>	
B.	PVC pipe		
	Volume of crushed PVC pipe (ft <sup>3</sup> )	108	
	Volume of disposal assuming 50% void space (ft <sup>3</sup> )	162	
	Transportation and disposal unit cost (\$/ft <sup>3</sup> )	<b>\$3.85</b>	
	Subtotal PVC pipe transportation and disposal costs	<b>\$624</b>	
C.	Pumps		
	Volume of pumps (ft <sup>3</sup> )	145	
	Volume of disposal assuming 50% void space (ft <sup>3</sup> )	217.5	
	Transportation and disposal unit cost (\$/ft <sup>3</sup> )	<b>\$3.85</b>	
	Total dryer transportation and disposal costs per facility	<b>\$837</b>	
D	Reverse osmosis unit		
	RO volume (ft <sup>3</sup> )	1000	
	Volume for disposal assuming RO remains intact (ft <sup>3</sup> )	1000	
	Transportation and disposal unit cost (\$/ft <sup>3</sup> )	<b>\$3.85</b>	
	Total dryer transportation and disposal costs	<b>\$3,850</b>	
E	Brine concentrator		
	BC volume (ft <sup>3</sup> )	4000	
	Volume for disposal assuming BC remains intact (ft <sup>3</sup> )	4000	
	Transportation and disposal unit cost (\$/ft <sup>3</sup> )	<b>\$3.85</b>	
		<b>\$15,400</b>	
	Total equipment transportation and disposal costs		<b>\$28,219</b>
<b>III. Health and Safety Costs</b>			
	Radiation safety equipment	1000	
	Total health and safety costs		\$2,000
<b>TOTAL EQUIPMENT REMOVAL AND DISPOSAL COSTS</b>			<b>\$62,019</b>

## Unit 1 Wellfield Buildings and Equipment Removal and Disposal

	<u>Description</u>	<u>Unit</u>	<u>Total</u>
I.	<b>Wellfield Piping</b>		
	Assumptions:		
	Total length of piping (ft)	125950	
	Labor included in per foot costs		
A.	Removal and loading		
	Wellfield piping removal unit cost (\$/ft of pipe)	0.36	
	Subtotal wellfield piping removal and loading costs	\$45,342	
B.	Pipe crushing		
	Number of operators	2	
	Operator hourly rate	\$15	
	Feet pipe per hour	300	
	Subtotal crushing cost	\$12,595	
C.	Transport and disposal costs (NRC-licensed facility)		
	Average diameter of piping (inches)	2	
	Crushed volume (ft <sup>3</sup> /ft)	0.012	
	Crushed volume total (ft <sup>3</sup> )	1546	
	Volume for disposal assuming 100% void space (ft <sup>3</sup> )	3091	
	Transportation and disposal unit cost (\$/ft <sup>3</sup> )	<b>\$3.85</b>	
	Subtotal wellfield piping transport and disposal costs	<b>\$11,901</b>	
	Wellfield piping costs per wellfield		
	Total wellfield piping costs		<b>\$69,838</b>
II.	<b>Well Pumps and Tubing</b>		
	Assumptions:		
	Ongoing pump and tubing removal costs included under ground water restoration labor costs		
	40 production wells contain pumps and tubing		
A.	Pump and tubing transportation and disposal		
	Number of production wells	295	
	Number of injection wells	285	
1	Pump volume		
	Number of production wells with pumps	40	
	Average pump volume (ft <sup>3</sup> )	1	
	Pump volume per wellfield (ft <sup>3</sup> )	40	
2	Tubing volume		
	Assumptions:		
	Average tubing length/wellfield based on average well depth minus 600 feet		
	Number of production wells with tubing	40	
	Average tubing length per well (ft)	600	
	Tubing length per wellfield (ft)	24000	
	Diameter of production well fiberglass tubing (inches)	2	
	Crushed volume reduction (ft <sup>3</sup> /ft)	0.012	
	Wellfield pipe volume w 100% void	589	
	Volume of pump and tubing (ft <sup>3</sup> )	629	
	Volume for disposal assuming 50% void space (ft <sup>3</sup> )	944	
	Transportation and disposal unit cost (\$/ft <sup>3</sup> )	<b>\$3.85</b>	
	Subtotal pump and tubing transport and disposal costs	<b>\$3,632.76</b>	
	Pump and tubing costs per wellfield		<b>\$3,632.76</b>

## Building and Demolition and Disposal

### Assumptions:

- Churchrock offices will be of modular design and sold
- Crownpoint offices will be left intact after the project ends

	<u>Description</u>	<u>CR Satellite</u>	<u>Cost</u>
<b>I.</b>	<b>Decontamination Costs</b>		
A.	Wall decontamination		
	Area to be decontaminated (ft <sup>2</sup> )	12167	
	Application rate (gallons/ft)	1	
	HCl acid wash, including labor (\$/gallon)	\$0.50	
	Subtotal wall decontamination costs	\$6,083	\$6,083
B.	Concrete floor decontamination		
	Area to be decontaminated (ft <sup>2</sup> )	10491	
	Application rate (gallons/ft)	4	
	HCl acid wash, including labor (\$/gallon)	\$0.50	
	Subtotal concrete floor decontamination costs	\$20,982	\$20,982
<b>II.</b>	<b>Demolition Costs</b>		
A.	Building		
	Dryer bldg. demolition unit cost of \$0.75/ft <sup>3</sup> for additional radiation safety precautions.		
	Volume of building (ft <sup>3</sup> )	209820	
	Demolition unit cost per WDEQ Guideline No. 12 (\$/ft <sup>3</sup> )	\$0.15	
	Dryer building demolition unit cost (\$/ft <sup>3</sup> )		
	Subtotal building demolition costs	\$31,893	\$31,893
B.	Concrete floor		
	Area of concrete floor (ft <sup>2</sup> )	10491	
	Demolition unit cost (ft <sup>3</sup> ) per local estimate	\$1.20	
	Subtotal concrete floor demolition costs	\$12,589	\$12,589
<b>III.</b>	<b>Disposal Costs</b>		
A.	Building		
	Volume of building (cy)	7771	
1	Unrestricted		
	Unrestricted disposal cost of 26.7 \$/yd <sup>3</sup>	\$27.00	
	Building will collapse to 10% of standing volume	777	
	Percentage (%) on site	100	
	Subtotal unrestricted disposal costs	\$20,982	\$20,982
B.	Concrete floor		
	Area of concrete floor (ft <sup>2</sup> )	10491	
	Average Thickness of concrete floor (ft)	0.5	
	Volume of concrete floor (ft <sup>3</sup> )	5246	
	Volume of concrete floor (cy)	194	
1	Unrestricted		
	Percentage (%)	100	
	Volume for disposal (ft <sup>3</sup> )	194	
	Disposal unit cost \$/cy	\$27.00	
	Subtotal on-site disposal costs	\$5,246	\$5,246
<b>III.</b>	<b>Health and Safety Costs</b>		
	Total health and safety costs		\$1,000
<b>TOTAL BUILDING DEMOLITION AND DISPOSAL COSTS</b>			<b>\$98,775</b>

**Wellfield and Satellite Surface Reclamation**

	<u>Description</u>	<u>Unit</u>	<u>Total</u>
I.	<b>Wellfield Area Reclamation</b>		
	Wellfields rea (acres)	102	
	Disking/seeding unit cost (\$/acre)	\$200	
	Subtotal reclamation costs for wellfield		\$20,400
II.	<b>Wellfield Road Reclamation</b>		
	Length of wellfield roads (1000 ft)	5	
	Wellfield road reclamation unit cost (\$/1000 ft)	\$690	
	Subtotal wellfield road reclamation costs		\$3,450
III.	<b>Pond Decomissioning (120')</b>		
	Assumptions:		
	Sediment disposal of 1 foot (ft3) deep	3972	
	2 Pond dimension are 120 ft x 120 ft. x 10 ft. or 1 acre footprint	1	
	Disposal of inner and outer liners		
	Soil below the liners is not contaminated.		
	Folded liner volume each (ft3).	600	
	Backhoe hourly rate (w/operator)	\$37.75	
	Bulldozer hourly rate (w/operator)	\$37.75	
A.	Removal and loading		
	1 Equipment		
	Number of backhoes	1	
	Number of hours	10	
	Number of bulldozers	1	
	Number of hours	10	
	2 Labor		
	Number of persons	3	
	Number of hours	10	
	\$/hr/person	\$15.00	
	Total removal and loading costs	\$1,205.00	
B.	Transportation and disposal liners & sediment		
	Transportation and disposal unit costs (\$/ft3)	\$3.85	
	Total transportation and disposal costs 2 liners	\$19,912.20	
	Subtotal pond reclamation costs (2 ponds)		\$42,234

October 15, 2010

**HRI CROWNPOINT URANIUM PROJECT**  
**Financial Assurance Plan for the Unit 1 Site**  
**Summary**

Category	Project Total	Contingency/ Profit 15%	Contingency/ Profit 25%
Groundwater Restoration	\$8,542,567	\$1,281,385	
Groundwater Stability Analysis	\$216,240	\$32,436	
Well Plugging	\$2,304,044	\$345,607	
Equipment Removal	\$62,019	\$9,303	
Wellfield D & D	\$195,161		\$48,790
Building D & D	\$98,775		\$24,694
Surface Reclamation	\$199,212		\$49,803
Totals	\$11,618,016	\$1,668,730	\$123,287
Contingency/Profit			\$1,792,017
Total Surety			\$13,410,033

## ABBREVIATIONS/ACRONYMS

\$	Dollars
\$/Kgal	Dollars per 1000 gallons
avg	average
BBLs	42 Gallon Barrel
ft	feet
ft <sup>2</sup>	square feet
ft <sup>3</sup> /CU FT	cubic feet
gal	gallons
gpm	gallons per minute
H&S	Health and Safety
H <sub>2</sub> S	Hydrogen Sulfide
H <sub>2</sub> SO <sub>4</sub>	Sulfuric Acid
HCl	Hydrochloric Acid
Hp	Horsepower
Kgal	1000 gallons
Kwh	Kilowatt-hours
HaOH	Caustic Soda
OD	Outside Diameter
PPE	personal protective equipment
PV	Pore Volume
reqm't	requirement
RO	Reverse Osmosis
SXS	sacks (94 lbs. cement, 50 lbs. gel)
WDEQ	Wyoming Department of Environmental Quality
WDW	Waste Disposal Well

yd<sup>3</sup>/CU YD

cubic yards

yr

year