

HRI Churchrock Project
Section 17 Wellfield Equipment Tabulation

# H. Houses	# Injectors	# Extractors	# Feet 2"	# Feet 10"	# Feet 14"	Gravel Road
1	21	18	4240	360		
2	21	18	12210	520		
3	19	21	9640	580		
4	23	26	6780	1080		
5	16	30	3150	340		
6	13	18	2750	280		
Totals	113	113	38770	3160	4500	2250

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

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
D	123,023	7.5	922,673	0.25	7.48	1,725,398	1.5	1.3	3,364,525	30,280,727
UUPC	22,665	8.5	192,653	0.25	7.48	360,260	1.5	1.3	702,507	6,322,566
UPC	113,140	7.3	825,922	0.25	7.48	1,544,474	1.5	1.3	3,011,725	27,105,521
LPC	50,751	8	406,008	0.25	7.48	759,235	1.5	1.3	1,480,508	13,324,574
UA	36,220	5.6	202,832	0.25	7.48	379,296	1.5	1.3	739,627	6,656,642
LA	161,163	8.2	1,321,537	0.25	7.48	2,471,273	1.5	1.3	4,818,983	43,370,849
UB	160,090	9.1	1,456,819	0.25	7.48	2,724,252	1.5	1.3	5,312,290	47,810,614
LUB	186,430	8.5	1,584,655	0.25	7.48	2,963,305	1.5	1.3	5,778,444	52,006,000
LB	175,981	10.6	1,865,399	0.25	7.48	3,488,295	1.5	1.3	6,802,176	61,219,584
UC	181,120	9.1	1,648,192	0.25	7.48	3,082,119	1.5	1.3	6,010,132	54,091,189
ULC	107,214	6.8	729,055	0.25	7.48	1,363,333	1.5	1.3	2,658,500	23,926,498
LC	169,010	6.5	1,098,565	0.25	7.48	2,054,317	1.5	1.3	4,005,917	36,053,255
UD	142,694	8.6	1,227,168	0.25	7.48	2,294,805	1.5	1.3	4,474,870	40,273,826
MD	75,350	11.2	843,920	0.25	7.48	1,578,130	1.5	1.3	3,077,354	27,696,189
LD	170,394	11.2	1,908,413	0.25	7.48	3,568,732	1.5	1.3	6,959,027	62,631,245
UE	265,391	10.2	2,706,988	0.25	7.48	5,062,068	1.5	1.3	9,871,032	88,839,292
LE	361,312	7.7	2,782,102	0.25	7.48	5,202,531	1.5	1.3	10,144,936	91,304,428
SEC. 17 TOTALS	2,501,948		21,722,900			40,621,823			79,212,556	712,913,000

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

Number of Wells

Extraction Wells

Header House 1	18
Header House 2	18
Header House 3	21
Header House 4	26
Header House 5	30
Header House 6	18
Total	131

Injection Wells

Header House 1	21
Header House 2	21
Header House 3	19
Header House 4	23
Header House 5	16
Header House 6	13
Total	113

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

Total Per Foot Cost \$0.45

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 trackhoe 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

Total Per Foot Cost \$0.36

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 or \$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

TOTAL WELLFIELD ROAD RECLAMATION \$690.28

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 yds³. Drum truck capacity 64 yds³.
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 yd³
2. Transportation assumed a 30 mile trip at \$2.00 per mile. Bulk truck capacity 20 yds³.

	<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	Rev. March 16, 2001										
2	LABOR SUMMARIES										
3											
4											
5											
6							Number	Hourly Rate	Yearly Salary	Annual	Monthly
7											
8	Management and Accounting										
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	Plant Personnel										
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	Wellfield Personnel										
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	Engineering & Geologic Personnel										
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

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 ³ /mo)*	87
Solids (ft ³ /mo)	2,355
Unit disposal cost (\$/ft ³)	\$2.78
Monthly disposal cost (\$)	\$6,541

*1 yd³ ~ 1 ton

GROUND WATER RESTORATION Sampling

Units Sub Total Total

Assumptions:

- Labor from staff
- Routine monitoring is covered in the restoration budget
- One baseline well sampled per acre of wellfield (28)
- One sample taken before restoration starts
- Baseline wells sampled once per year during restoration
- Stability samples taken every 2 months for six months

I Monitoring and sampling costs

A. Restoration well sampling

Estimated restoration period (years)	4.4		
1 Well Sampling prior to restoration start			
# of wells	28		
\$/sample	\$380	\$10,640	
2 Restoration progress sampling			
# of wells	28		
\$/sample	\$120		
Samples/year	1	\$13,440	

B. Stability

Estimated stabilization period (months)	6		
# of wells	28		
Sample freq. mos.	2		
\$/sample	\$380		
Total		\$31,920	

Total monitoring and sampling costs

\$56,000

CHURCHROCK SECTION 17 WELL PLUGGING AND ABANDONMENT

Assumptions

- 1. Cement shrinkage 120%
- 2. Cement cost per 94 pound sack **\$6.82**
- 3. Cost for Gel per 50 pound sack **\$12.65**
- 4. Holes Plugged per day 6
- 5. Engineer/geologist - per year (assume 20% time for this project) \$50,000.00
- 6. Backhoe & operator - per hour \$37.75
- 8. Cementer Contractor per well for cementing 800 ft hole \$450.00
- 9. Pump Hoist Contractor per well for cementing 800 ft hole \$375.00
- 10. Wellfield acreage fully developed 40 ac.
- 11. Assume Cement Mixture will be 12.5 ppg with 2% gel
- 12. SX required for 800 ft (6" csg) of 12.5 ppg cement with 2% Gel (without shrinkage factor) 75.3
- 13. SX gel required for 75.3 SX Cmt (without shrinkage factor) 2.8
- 14. SX required for 800 ft (5" csg) of 12.5 ppg cement with 2% Gel (without shrinkage factor) 52.3
- 15. SX gel required for 52.3 SX Cmt (without shrinkage factor) 1.9
- 16. One Cubuc Yard equals 4.808905 bbls.
- 17. 1" Sch 40 Tremie pipe cost for circulating in cement to Total Depth (per ft.) **\$0.31**

Unit of Measure	IN	# of Wells	FT	FT	Cost	CU YD	CUFT	BBLs	SXS	SXS	w/o shrinkage	with shrinkage	BACKHOE	ENG/GEOL	tract Cementer
ITEM	WELL	QTY	AVERAGE	Tremie Pipe Required for Cementing	Tremie Pipe Required for Cementing	HOLE	HOLE	CEMENT REQ'D (w/shrinkage)	CEMENT REQ'D (wo/shringage)	GEL \$ / well (wo/shrinkage)	CEMENT & GEL \$ / well	CEMENT & GE \$ / well	\$ / well Assume 10 hr days	\$ / well	ng/Pumping Cer
Injectors	6	113	900	900	\$279.00	6.542	176.6	37.7	84.7	3.2	\$617.59	\$741.10	\$62.92	\$32.05	\$506
Extractors	6	131	900	900	\$279.00	6.542	176.6	37.7	84.7	3.2	\$617.59	\$741.10	\$62.92	\$32.05	\$506
Deep Monitor	5	17	1000	1000	\$310.00	5.048	136.3	29.1	94.1	3.5	\$686.21	\$823.45	\$62.92	\$32.05	\$563
Brushy Monitor	5	7	800	800	\$248.00	4.038	109.0	23.3	75.3	2.8	\$548.97	\$658.76	\$62.92	\$32.05	\$450
Dakota Monitor	5	4	700	700	\$217.00	3.533	95.4	20.4	65.9	2.5	\$480.35	\$576.41	\$62.92	\$32.05	\$394
Recapture Monitor	5	4	1100	1100	\$341.00	5.552	149.9	32.0	103.5	3.9	\$754.83	\$905.79	\$62.92	\$32.05	\$619
Section 17 Total															

III. Buried Trunkline			
	Length of trunkline trench (ft)	2250	
A.	Removal and Loading		
	Main pipeline removal unit cost (\$/ft of trench)	\$0.45	
	Subtotal trunkline removal and loading costs	\$1,013	
B.	Pipe cutting		
	Number of operators	2	
	Operator hourly rate	\$15	
	Feet pipe per hour	100	
	Subtotal cutting cost	\$675	
C.	Transport and disposal costs (NRC-licensed facility)		
1	10" HDPE trunkline		
	Piping length (ft)	1580	
	Inj and ext length	3160	
	Cut volume (ft ³ /ft)	0.14	
	Cut volume (ft ³)	442	
2	14" HDPE trunkline		
	Piping length (ft)	2250	
	Inj and ext length	4500	
	Cut volume (ft ³ /ft)	0.24	
	Cut volume (ft ³)	1067	
	Total trunkline chipped volume (ft ³)	1509	
	Volume for disposal assuming 50% void space (ft ³)	2263	
	Transportation and disposal unit cost (\$/ft ³)	\$3.85	
	Subtotal trunkline transport and disposal costs	\$8,714	
	Trunkline decommissioning costs		\$10,401
IV. Well Houses			
	Total quantity	40	
	Average well house volume (ft ³)	12.5	
A.	Removal		
	Total volume (ft ³)	500	
	Demolition unit cost per WDEQ Guideline No. 12 (\$/ft ³)	\$0.15	
	Subtotal well house demolition costs	\$76	
B.	Survey and decontamination		
	Assumptions:		
	Cost per well house	\$5	
	Subtotal Survey and decontamination costs	\$200	
C.	Disposal		
	Total volume (yd ³)	19	
	Volume for disposal assuming 10% void space (cy)	20	
	Unrestricted disposal cost of 26.7 \$/yd ³	\$27.00	
	Subtotal unrestricted disposal costs	\$530	
	Well house removal and disposal per wellfield		\$806

Wellfield Surface Reclamation

	<u>Description</u>	<u>Unit</u>	<u>Total</u>
I.	Wellfield Area Reclamation		
	Wellfields area (acres)	28	
	Disking/seeding unit cost (\$/acre)	\$200	
	Subtotal reclamation costs for wellfield		\$5,600
II.	Wellfield Road Reclamation		
	Length of wellfield roads (1000 ft)	2.25	
	Wellfield road reclamation unit cost (\$/1000 ft)	\$690	
	Subtotal wellfield road reclamation costs		\$1,553
TOTAL WELLFIELD AND SATELLITE SURFACE RECLAMATION COSTS			\$7,153

HRI CROWNPOINT URANIUM PROJECT
Financial Assurance Plan for Churchrock Section 17
Summary

Category	Project Total	Contingency/ Profit 15%	Contingency/ Profit 25%
Groundwater Restoration	\$4,089,818	\$613,473	
Groundwater Stability Analysis	\$56,000	\$8,400	
Well Plugging	\$566,087	\$84,913	
Wellfield D & D	\$60,389		\$15,097
Surface Reclamation	\$7,153		\$1,788
Totals	\$4,779,446	\$706,786	\$16,885
Contingency/Profit			\$723,671
Total Surety Proposed			\$5,503,117

ABBREVIATIONS/ACRONYMS

\$	Dollars
\$/Kgal	Dollars per 1000 gallons
avg	average
BBLs	42 Gallon Barrel
ft	feet
ft ²	square feet
ft³/CU FT	cubic feet
gal	gallons
gpm	gallons per minute
H&S	Health and Safety
H ₂ S	Hydrogen Sulfide
H ₂ SO ₄	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