

COST TABLES

Table 12.1. Alternative 2R, Cost Detail

Cost Estimate Summary for the Selected Remedy - East Helena Superfund Site
Residential Areas - Alternative 2R - Remove / Dispose / Replace Existing Residential Sites with Lead Levels greater than 1,000 ppm

Capital Cost for Remedy - (2 years)

DESCRIPTION	QUANTITY	UNIT	UNIT COST	COST	Notes / Assumptions
EPA Oversight / Administration	2	year	\$60,000	\$120,000	Estimate at 500 hours per year at \$120 per hour
Site Remediation - Excavation / Replace					Construction activities for unremediated sites with lead-in-soil levels greater than 1,000 ppm. Assumes a total of 128 existing unremediated residential sites to be cleaned up over 2 years.
Vacant Lots	9	site	\$30,600	\$275,400	Assumes an average yard size of 15,300 square feet per site at 8-9 inches depth. Assume \$2.00 per square foot to excavate, replace, landscape which yields \$30,600 per site (15,300 sf x \$2.00 per sf).
Residential Lots	24	site	\$30,600	\$734,400	Assumes average yard size of 15,300 square feet per site at 8-9 inches depth. For estimating purposes, assume 1/3 of a site has structures therefore 10,200 square feet of the site will be cleaned up. Assume \$3.00 per square foot to excavate, replace, landscape which yields \$30,600 per site (10,200 sf x \$3.00 per sf).
Road Aprons / Alleys	40	section	\$3,000	\$120,000	Estimate 40 known sections of Road Aprons have been pre-sampled and have lead levels greater than 1,000 ppm. Each section is approximately 150 feet long and 10 feet wide (1,500 square feet). Assume approximate cost of \$2.00 per square foot to clean up (\$3,000 per section).
Ditches and Channels	12000	square feet	\$3	\$36,000	Assume certain ditches and channels adjacent to sites may require remediation at linear areas. Assume 50 linear feet by 10 foot width by 73 residential sites.
Sampling, Collection, and Analysis					
Residential Lots - Pre-Remediation	100	site	\$350	\$35,000	Approximately 100 sites require sampling. Assumes \$350 per site for collection, analysis, and shipping of 7 samples per site.
Road Aprons / Alleys - Pre-Remediation	40	section	\$95	\$3,800	Assumes 40 new sections require sampling. Assume \$95 per sample which includes collection, analysis, and shipping of one sample per site.
SUBTOTAL Capital Costs				\$1,324,600	
Mobilization / Demobilization & Division 1 Costs				\$52,984	Assumes 4% of Capital Costs
Contractor Overhead and Supervision				\$105,968	Assumes 8% of Capital Costs
Fuel cost adjustment for site remediation				\$57,793	Fuel cost adjustment applied to Site Remediation tasks only.
Contingencies (20%)				\$264,920	Assumes contingencies at 20% of Capital Costs
TOTAL CAPITAL COSTS				\$1,806,265	

Annual Costs - Operation and Maintenance (30 years)

DESCRIPTION	QUANTITY	UNIT	UNIT COST	COST	Notes / Assumptions
Construction at Previously Remediated Sites	10	site	\$440	\$4,400	Assumes 20 cubic yards (CY) per project, haul costs = \$5 per CY (for small quantities), replacement soil = \$17 per CY delivered, (\$440 per site). Assumes 10 sites per year.
Gardens - Excavation / Replace	5	site	\$750	\$3,750	Assumes 5 gardens per year at \$750 per garden to haul the excavated soils and provide new soil.
Monitor Children's Blood-Lead Level	150	each	\$60	\$9,000	Assumes 150 children randomly sampled per year at \$60 per test.
Institutional Controls and Lead and Education and Abatement Program				\$120,000	Estimate based on historical costs of Lead Education and Abatement Program
Five-Year Review					
Soil Monitoring	10	site	\$285	\$2,850	Assumes sampling every year, sampling 10 sites per year, total \$285 per site includes collection, analysis, and shipping.
Prepare 5-year Report	0.20	lump sum	\$18,000	\$3,600	Assumes 150 hours for analysis and report development at \$120 per hour. Assumes 1/5 of costs incurred on an annual basis.
SUBTOTAL Annual Costs				\$143,600	
Project Management and Support (15%)				\$21,540	
Contingencies (20%)				\$28,720	
TOTAL ANNUAL COSTS				\$193,860	

TOTAL PROJECT COSTS

Present Value of Capital Costs	\$1,763,258	Assumes 2 year construction period. Present worth costs assumes 1/2 of capital costs incurred each year. Assumes 5% discount rate for 2 years.
Present Value of Annual Costs	\$2,980,103	Assumes 5% discount rate for 30 years

TOTAL PRESENT VALUE - Alternative 2R **\$4,743,362**

Table 12-2. Alternative 2R, Present Worth Analysis

East Helena Superfund Site - Preferred Remedy Alternative 2R

Year	Capital Cost	Annual O&M Cost	Total Cost	Discount Factor (5%)	Present Worth
0	\$903,132		\$903,132	1.000	\$903,132
1	\$903,132	\$193,860	\$1,096,992	0.952	\$1,044,755
2		\$193,860	\$193,860	0.907	\$175,837
3		\$193,860	\$193,860	0.864	\$167,464
4		\$193,860	\$193,860	0.823	\$159,489
5		\$193,860	\$193,860	0.784	\$151,894
6		\$193,860	\$193,860	0.746	\$144,661
7		\$193,860	\$193,860	0.711	\$137,773
8		\$193,860	\$193,860	0.677	\$131,212
9		\$193,860	\$193,860	0.645	\$124,964
10		\$193,860	\$193,860	0.614	\$119,013
11		\$193,860	\$193,860	0.585	\$113,346
12		\$193,860	\$193,860	0.557	\$107,949
13		\$193,860	\$193,860	0.530	\$102,808
14		\$193,860	\$193,860	0.505	\$97,912
15		\$193,860	\$193,860	0.481	\$93,250
16		\$193,860	\$193,860	0.458	\$88,809
17		\$193,860	\$193,860	0.436	\$84,580
18		\$193,860	\$193,860	0.416	\$80,553
19		\$193,860	\$193,860	0.396	\$76,717
20		\$193,860	\$193,860	0.377	\$73,064
21		\$193,860	\$193,860	0.359	\$69,585
22		\$193,860	\$193,860	0.342	\$66,271
23		\$193,860	\$193,860	0.326	\$63,115
24		\$193,860	\$193,860	0.310	\$60,110
25		\$193,860	\$193,860	0.295	\$57,247
26		\$193,860	\$193,860	0.281	\$54,521
27		\$193,860	\$193,860	0.268	\$51,925
28		\$193,860	\$193,860	0.255	\$49,452
29		\$193,860	\$193,860	0.243	\$47,098
30		\$193,860	\$193,860	0.231	\$44,855
TOTALS	\$1,806,265	\$5,815,800	\$7,622,065		\$4,743,362

PV Capital \$1,763,258

PV O&M \$2,980,103

Table 12-3. Alternative 4U, Cost Detail

Cost Estimate Summary for the Selected Remedy - East Helena Superfund Site
Undeveloped Lands - Alternative 4U - In Situ Treatment (500 ppm lead) for Ditches, Channels, and Railroad Right-of-Way

Capital Cost for Remedy - (3 years)

DESCRIPTION	QUANTITY	UNIT	UNIT COST	COST	Notes / Assumptions
EPA Oversight / Administration	0	year	\$60,000	\$0	Assumes that remediation of ditches and channels and railroad ROW occurs during the same time frame as residential cleanups, and EPA oversight/administrative costs are therefore already accounted for in the residential alternatives.
Site Remediation - Excavation / Replace & Deep Till					
Excavate / Replace - Areas Adjacent to Ditches and Channels	20000	square feet	\$2.00	\$40,000	Assumes clean up of 2,000 lineal feet of 20 foot wide ditches/channels over 3 years (40,000 sf). Assume 50% of the ditches (20,000 sf) excavated and replaced at historic site cost of \$2 per square foot.
Excavate / Replace - Railroad Right-of-Way (excludes central section thru Smelter Complex)	1538874	square feet	\$2.20	\$3,385,523	Assumes three segments of railroad right-of-way (ROW) at 135.5 feet wide from previous estimate documents in Jan. 2006. The first segment is 5,918 feet west of the smelter complex and the second segment is 2,792 feet thru the Smelter Complex, and the third segment is 5,439 feet east of the Smelter Complex. For this estimate only the segments west and east of the Smelter Complex are used for a total area of 1,538,874 square feet. ROW will be excavated and replaced at historic site cost of \$2.00 per square foot. Assume an additional 10% for insurance, flaggers, or other additional cost required to work on the railroad property (total \$2.20 per square foot).
Sampling, Collection, and Analysis					
Ditches / Channels Pre-Remediation Sampling	102	section	\$55	\$5,610	Assumes approximately 15,300 lineal feet of ditches/channels that have not been sampled to date. Assume they are sampled in 150 foot sections (102 sections), \$55 per section includes collection, analysis, and shipping.
Railroad Right-of-Way Pre-Remediation Sampling	23	acre	\$54	\$1,242	Assumes area sampled same as area for excavation / replace of railroad ROW, about 23 acres. Assume 23 samples (16 spot composites) are collected, \$54 per acre includes collection, analysis, and shipping.
SUBTOTAL Capital Costs				\$3,432,375	
Mobilization / Demobilization & Division 1 Costs				\$137,295	Assumes 4% of Capital Costs
Contractor Overhead and Supervision				\$274,590	Assumes 8% of Capital Costs
Fuel cost adjustment for Site Remediation				\$41,280	Fuel usage adjustment applied to Site Remediation tasks only. Estimated fuel usage based on total soil volume removal of approximately 48,000 cubic yards of materials. Machine handling fuel quantities assumed for excavation work using one medium duty loader/excavator at a fuel rate of 6 gallons per hour and one haul truck at 12 cubic yard capacity at a fuel rate of 8 gallons per hour. Cycle times are 125 cubic yards per hour for loader and 15 minutes for haul truck. These conservative rates yield a cumulative fuel usage is 8,000 to 10,000 gallons. Original remediation estimates are in 2003 costs. Fuel on average has increased 144% from 2003 to first quarter 2008. Rate of fuel increase in outyears is expected at 25% per year. Use 14,000 gallons fuel total at 2003 rate \$1.305 per gallon and 2008 rate of \$3.455 per gallon. Two years added at 25% per year rate increase.
Contingencies (20%)				\$686,475	Assumes contingencies at 20% of Capital Costs
TOTAL CAPITAL COSTS				\$4,572,015	

Annual Costs - Operation and Maintenance (30 years)

DESCRIPTION	QUANTITY	UNIT	UNIT COST	COST	Notes / Assumptions
Implement BAMP Program for Remaining Undeveloped Lands	1	year	\$15,000	\$15,000	Assumes 2 day inspections by 3 agricultural specialists per year and 10 days followup / education by county agent per year.
5-Year Review					
Assumes 1/5 of costs incurred on an annual basis					
Soil Monitoring	0.20	lump sum	\$16,800	\$3,360	Assumes sampling every 5 years, approximately 5,000 to 6,000 acres, 10% of acreage sampled at 1 sample per acre, \$28 per sample for collection, preparation and measurement using XRF instrument.
Prepare 5-year Report	0.20	lump sum	\$18,000	\$3,600	Assumes 150 hours for analysis and report development at \$120 per hour. Assumes 1/5 of costs incurred on an annual basis.
SUBTOTAL Annual Costs				\$21,960	
Project Management and Support (15%)				\$3,294	
Contingencies (20%)				\$4,392	
TOTAL ANNUAL COSTS				\$29,646	

TOTAL PROJECT COSTS					
Present Value of Capital Costs				\$4,357,756	Assumes 3 year construction period. Present worth costs assumes 1/3 of capital costs incurred each year. Assumes 5% discount rate for 3 years.
Present Value of Annual Costs				\$455,732	Assumes 5% discount rate for 30 years
TOTAL PRESENT VALUE - Alternative 4U				\$4,813,488	

Table 12-4. Alternative 4U, Present Worth Analysis

East Helena Superfund Site - Preferred Remedy Alternative 4U

Year				Discount	Present Worth
	Capital Cost	Annual O&M Cost	Total Cost	Factor (5%)	
0	\$1,524,005		\$1,524,005	1.000	\$1,524,005
1	\$1,524,005	\$29,646	\$1,553,651	0.952	\$1,479,668
2	\$1,524,005	\$29,646	\$1,553,651	0.907	\$1,409,207
3		\$29,646	\$29,646	0.864	\$25,609
4		\$29,646	\$29,646	0.823	\$24,390
5		\$29,646	\$29,646	0.784	\$23,228
6		\$29,646	\$29,646	0.746	\$22,122
7		\$29,646	\$29,646	0.711	\$21,069
8		\$29,646	\$29,646	0.677	\$20,066
9		\$29,646	\$29,646	0.645	\$19,110
10		\$29,646	\$29,646	0.614	\$18,200
11		\$29,646	\$29,646	0.585	\$17,333
12		\$29,646	\$29,646	0.557	\$16,508
13		\$29,646	\$29,646	0.530	\$15,722
14		\$29,646	\$29,646	0.505	\$14,973
15		\$29,646	\$29,646	0.481	\$14,260
16		\$29,646	\$29,646	0.458	\$13,581
17		\$29,646	\$29,646	0.436	\$12,934
18		\$29,646	\$29,646	0.416	\$12,319
19		\$29,646	\$29,646	0.396	\$11,732
20		\$29,646	\$29,646	0.377	\$11,173
21		\$29,646	\$29,646	0.359	\$10,641
22		\$29,646	\$29,646	0.342	\$10,134
23		\$29,646	\$29,646	0.326	\$9,652
24		\$29,646	\$29,646	0.310	\$9,192
25		\$29,646	\$29,646	0.295	\$8,755
26		\$29,646	\$29,646	0.281	\$8,338
27		\$29,646	\$29,646	0.268	\$7,941
28		\$29,646	\$29,646	0.255	\$7,563
29		\$29,646	\$29,646	0.243	\$7,202
30		\$29,646	\$29,646	0.231	\$6,859
TOTALS	\$4,572,015	\$889,380	\$5,461,395		\$4,813,488

PV Capital \$4,357,756
PV O&M \$455,732

Table 12-5. Alternative 4U, Cost Detail for In-place Treatment

Undeveloped Lands - Alternative 4U - Costs for Future Development of Undeveloped Land

Capital Costs for Lands to be Developed in the Future

DESCRIPTION	QUANTITY	UNIT	UNIT COST	COST	Notes / Assumptions
Cleanup Undeveloped Lands Planned for Development - Deep Tilling	1	acre	\$3,500	\$3,500	Historic site cost for deep tilling is \$3,500 per acre including deep tilling and soil amendments.
Pre-remediation Sampling Undeveloped Lands	1	acre	\$135	\$135	Assumes one 16-spot composite sample per acre, \$25 per sample analysis, 2 hour per sample to collect and prepare sample and provide data management at \$40 per hour, \$30 per sample shipping for total \$135 per sample.
<i>SUBTOTAL Capital Costs per acre</i>				\$3,635	
Mobilization / Demobilization & Division 1 Costs				\$145	Assumes 4% of Capital Costs
Contractor Overhead and Supervision				\$291	Assumes 8% of Capital Costs
Contingencies 30% (20% base plus 10% for fuel costs)				\$673	Assumes contingencies at 30% of Capital Costs (10% fuel incr.)
<i>TOTAL CAPITAL COSTS</i>				\$4,744	The capital cost per acre is based on 2006 costs. These costs will change in the future depending on market conditions.