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APPENDIX F
COST ESTIMATES

for

Laboratory for Energy-related Health Research/
Old Campus Landfill Superfund Site
University of California, Davis

prepared for

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ACRONYMS AND ABBREVIATIONS

CAMU	corrective action management unit
ET	Eastern Trenches
FS – Volume 1	*Final Feasibility Study for the University of California, Davis Areas Volume 1: Soil/Solid Waste and Soil Gas*
HFSDA	Hopland Field Station Disposal Area
LFU	landfill unit
O&M	operations and maintenance
PTW	principal threat waste
RACER	Remedial Action Cost Engineering and Requirements
Site	Laboratory for Energy-related Health Research/Old Campus Landfill Superfund Site
ST	Southern Trenches
UC Davis	University of California, Davis
VOC	volatile organic compound
WBH	Waste Burial Holes

APPENDIX F - COST ESTIMATES

This appendix presents the cost estimates for the ten alternatives being evaluated for the University of California, Davis (UC Davis) Laboratory for Energy-related Health Research (LEHR)/Old Campus Landfill (OCL) Superfund Site (Site), as described in the *Final Feasibility Study for the University of California, Davis* (UC Davis) *Areas Volume 1: Soil/Solid Waste and Soil Gas* (FS – Volume 1). The Remedial Action Cost Engineering and Requirements (RACER) cost estimating tool was used to generate estimates for the multiple phases of remediation, including pre-study, study, design, removal/interim action, remedial action, operations and maintenance, long-term monitoring, and site close-out.

To develop cost estimates, RACER assumes a work scope based on generic engineering solutions for environmental projects, technologies, and processes. RACER relies upon historical project information, industry data, government laboratories, construction management agencies, vendors, contractors, and engineering analyses to formulate the specific generic engineering solutions. RACER is updated annually with new technologies, engineering practices, and procedures to produce cost estimates reflective of current remediation processes and pricing (RACER 10.3).

The RACER estimates provided in the FS – Volume 1 use Site-specific parameters to reflect project-specific conditions and requirements. These conditions and requirements were then translated into specific quantities of work, which were then priced using current cost data. The majority of RACER's cost database is based on the Unit Price Book, published by the United States Army Corps of Engineers' Tri-Services Cost Engineering Group, but the database also includes cost data from other sources (RACER 10.3). Costs for all assemblies in the RACER database were updated in October 2009.

When using RACER, mark-up percentages can be specified for professional labor overhead/general and administrative costs, field office overhead/general and administrative costs, subcontractor profit, prime contractor profit, contingency, and owner costs. The mark-up values selected for each of these categories are shown in Attachment F-1a; these mark-up categories are defined by RACER in Attachment F-1b. Mark-up templates are specified for each cost component (e.g., "clearing and grubbing" or "Landfill Unit (LFU) No. 3 Excavation").

A summary of the capital, operations and maintenance, periodic, and total costs for each alternative is presented in Tables F-1 through F-9. The costs shown are the present values calculated using a discount factor of 2.7 percent over a period of 100 years. Figures F-1 through F-9 demonstrate that costs approach asymptotic levels after 100 years when discounts are applied. RACER is used to calculate costs in constant base year dollars (no escalation factors accounting for inflation are applied); present value cost calculations were performed after a cost estimate was generated by RACER.

Supporting documentation for this cost estimate, including assumptions and reports produced by RACER, are included for each alternative in the following subsections:

- Attachment F.2 Alternative SW-2

- Attachment F.3 Alternative SW-3
- Attachment F.4 Alternative SW-4
- Attachment F.5 Alternative SW-5
- Attachment F.6 Alternative SW-6
- Attachment F.7 Alternative SW-7
- Attachment F.8 Alternative SW-8
- Attachment F.9 Alternative SW-9
- Attachment F.10 Alternative SW-10

Each subsection will include the following documentation:

- Tables documenting the assumptions for each component of the alternative;
- Estimate Documentation Report (generated by RACER; included on CD); and
- A detailed line item estimate report, including quantities and unit prices (Assembly Level Report generated by RACER, in base year dollars; included on CD).

Attachments F.2a, F.3a, F.4a, F.5a, F.6a, F.7a, F.8a, F.9a, and F.10a contain assumption tables that summarize most of the input parameters RACER requires to generate a cost estimate. These tables provide the assumptions for each cost component and relevant sub-components.

The Estimate Documentation Reports in Attachments F.2b, F.3b, F.4b, F.5b, F.6b, F.7b, F.8b, F.9b, and F.10b are generated by RACER and list all input parameters for a given cost component and its sub-components. Many of the parameters are default values assigned by RACER. Site- and project-specific values originate from the assumption tables discussed above.

The Assembly Level Reports in Attachments F.2c, F.3c, F.4c, F.5c, F.6c, F.7c, F.8c, F.9c, and F.10c are generated by RACER and provide a summary of line item costs assumed for a given cost component. Values are shown in base year dollars and as direct costs (i.e., mark-ups are not applied). Note that "Phase Name" corresponds to a cost component name (e.g., LFU-3 Excavation). These "phases" make up the cost components summarized in Tables F-1 through F-9 for each alternative. In the Assembly Level Reports, the "Technology Name" category corresponds to a sub-component of the main cost component.

There is no supporting documentation for Alternative SW-1, No Action/No Further Action, as there are no costs associated with this alternative. Monitoring well decommissioning would be deferred to the No Action/No Further Action alternative in the *Feasibility Study for the University of California, Davis* (UC Davis) *Areas Volume 2: Groundwater*.

FIGURES

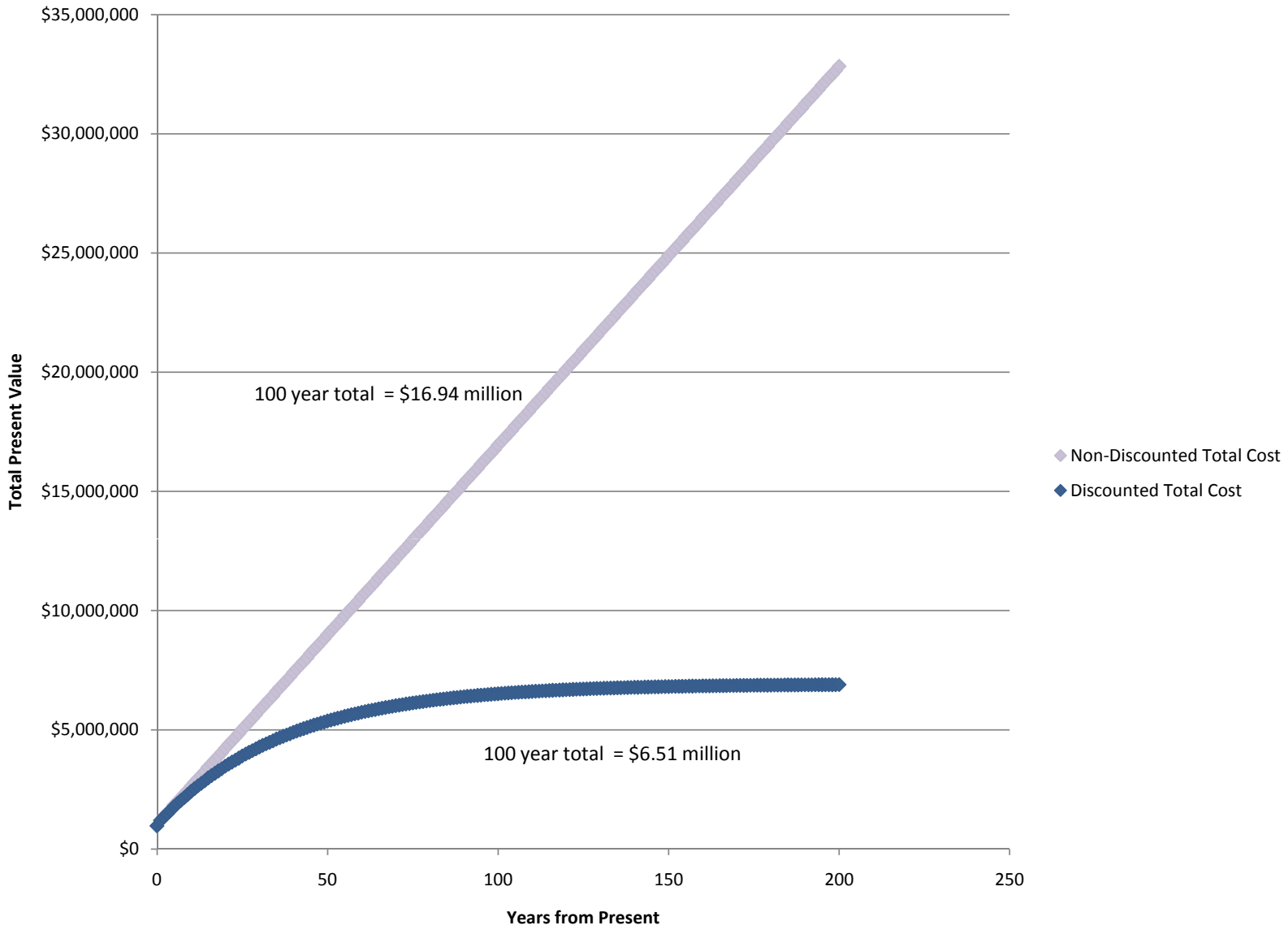


Figure F-1. Alternative SW-2 Non-Discounted versus Discounted Total Costs - Cost Estimates, UC Davis LEHR/OCL

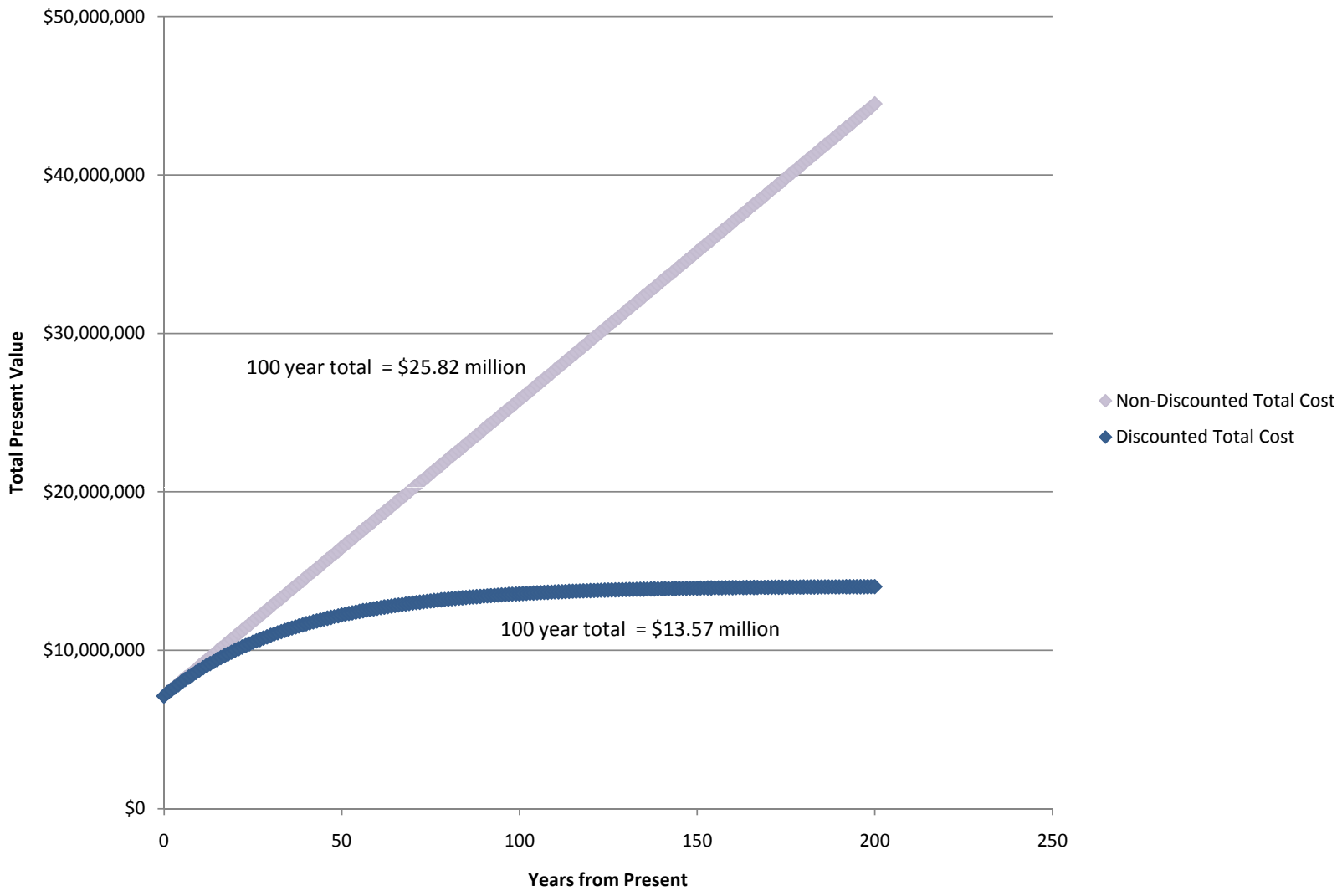


Figure F-2. Alternative SW-3 Non-Discounted versus Discounted Total Costs - Cost Estimates, UC Davis LEHR/OCL

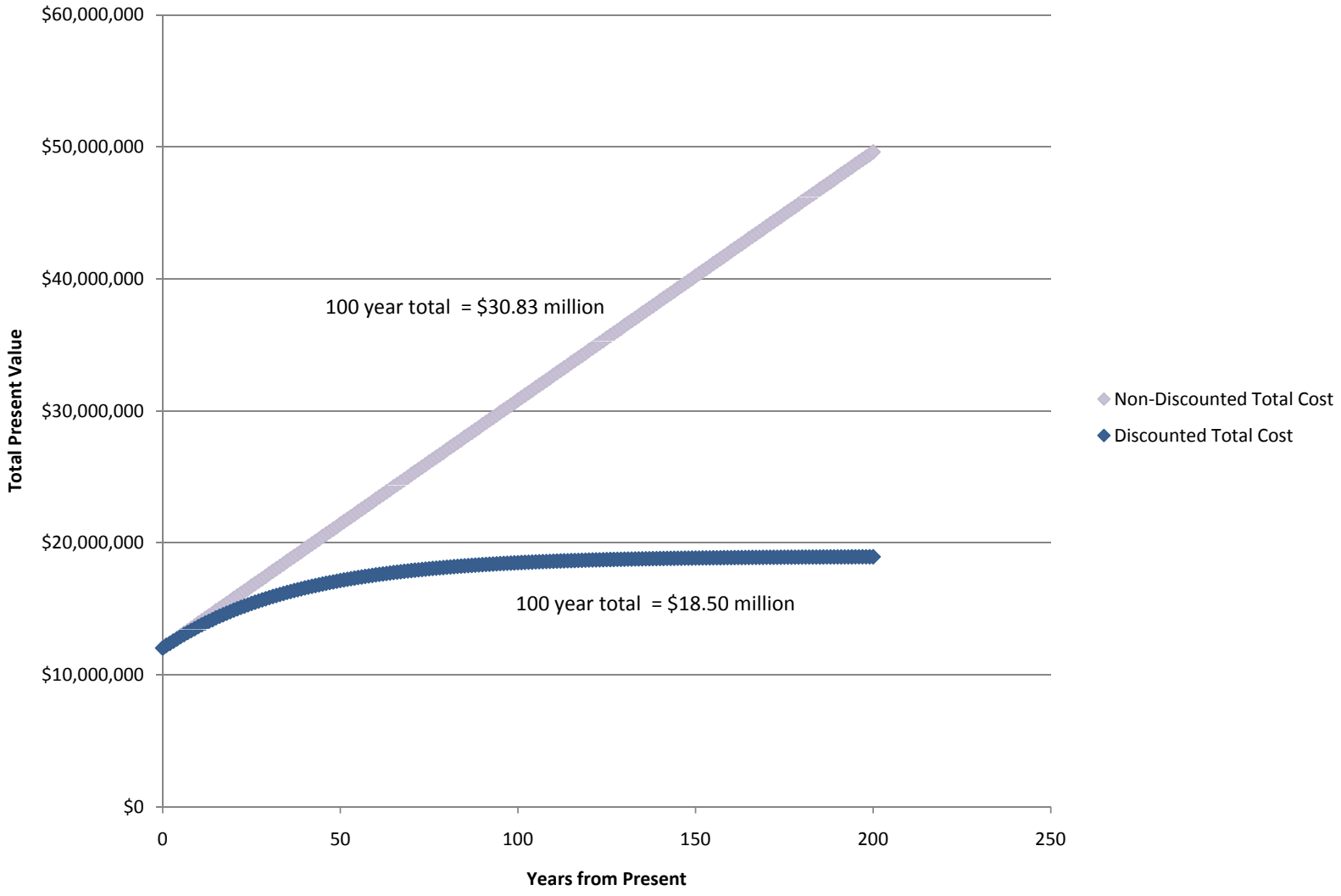


Figure F-3. Alternative SW-4 Non-Discounted versus Discounted Total Costs - Cost Estimates, UC Davis LEHR/OCL

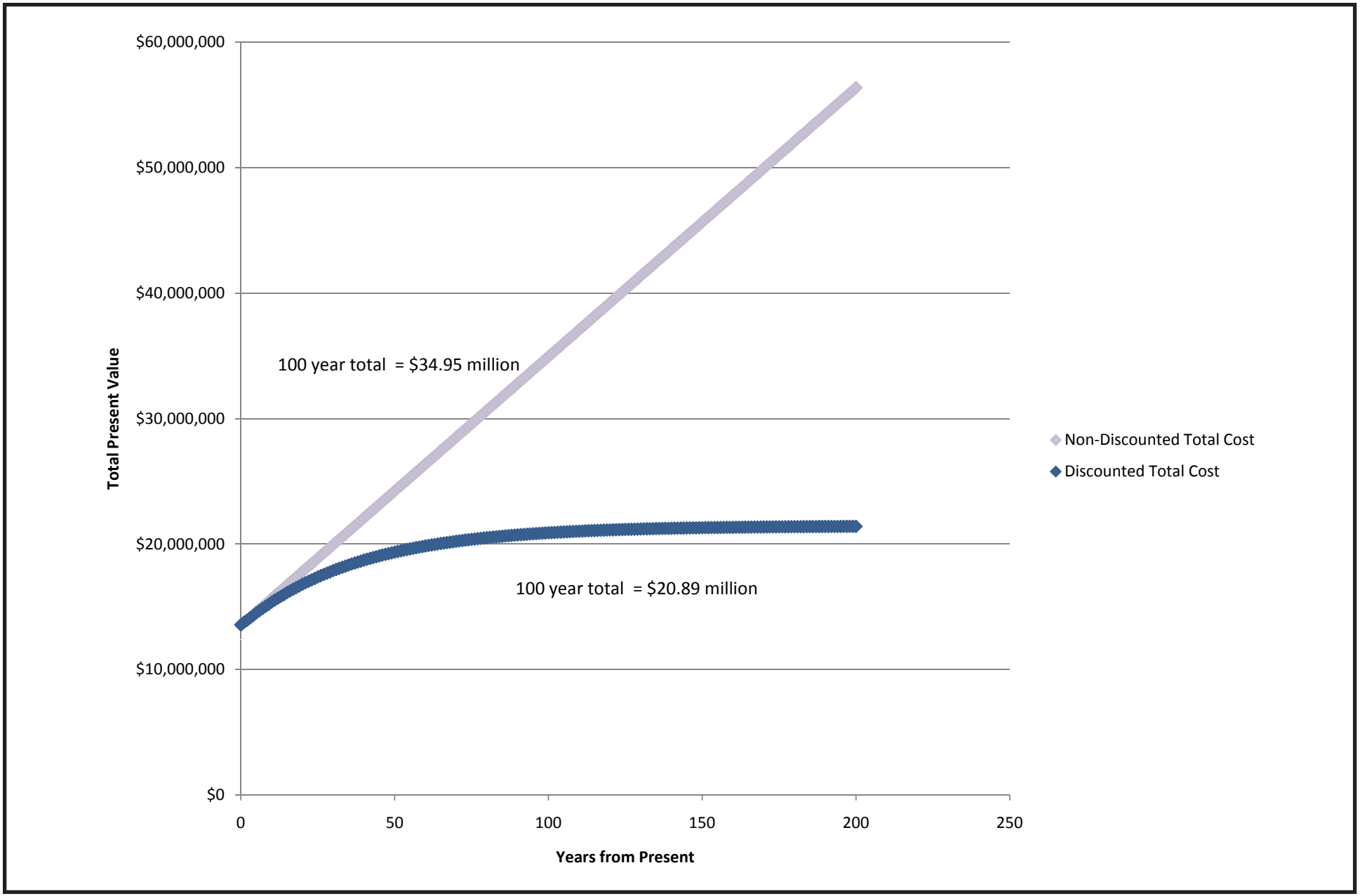


Figure F-4. Alternative SW-5 Non-Discounted versus Discounted Total Costs - Cost Estimates, UC Davis LEHR/OCL

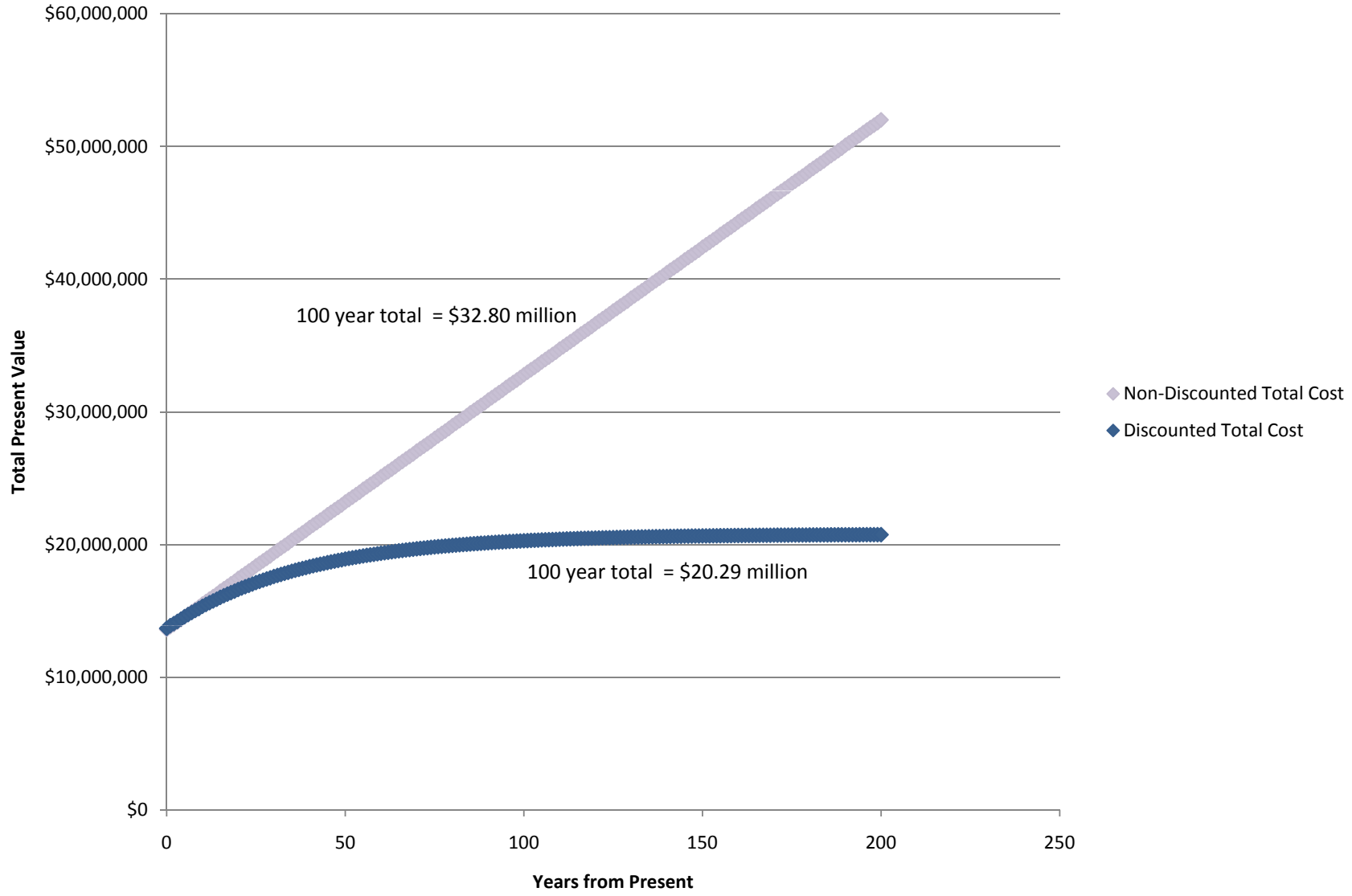


Figure F-5. Alternative SW-6 Non-Discounted versus Discounted Total Costs - Cost Estimates, UC Davis LEHR/OCL

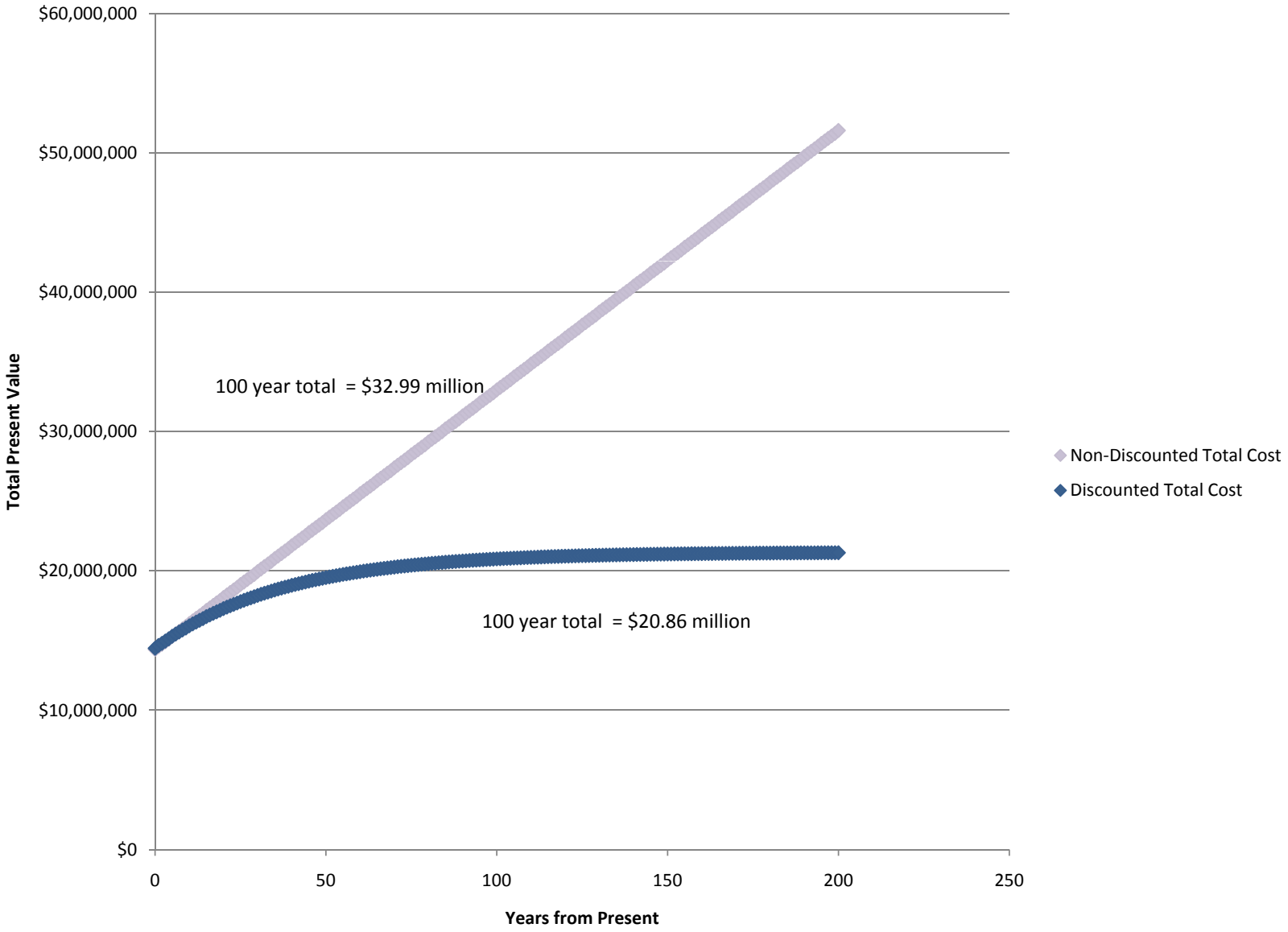


Figure F-6. Alternative SW-7 Non-Discounted versus Discounted Total Costs - Cost Estimates, UC Davis LEHR/OCL

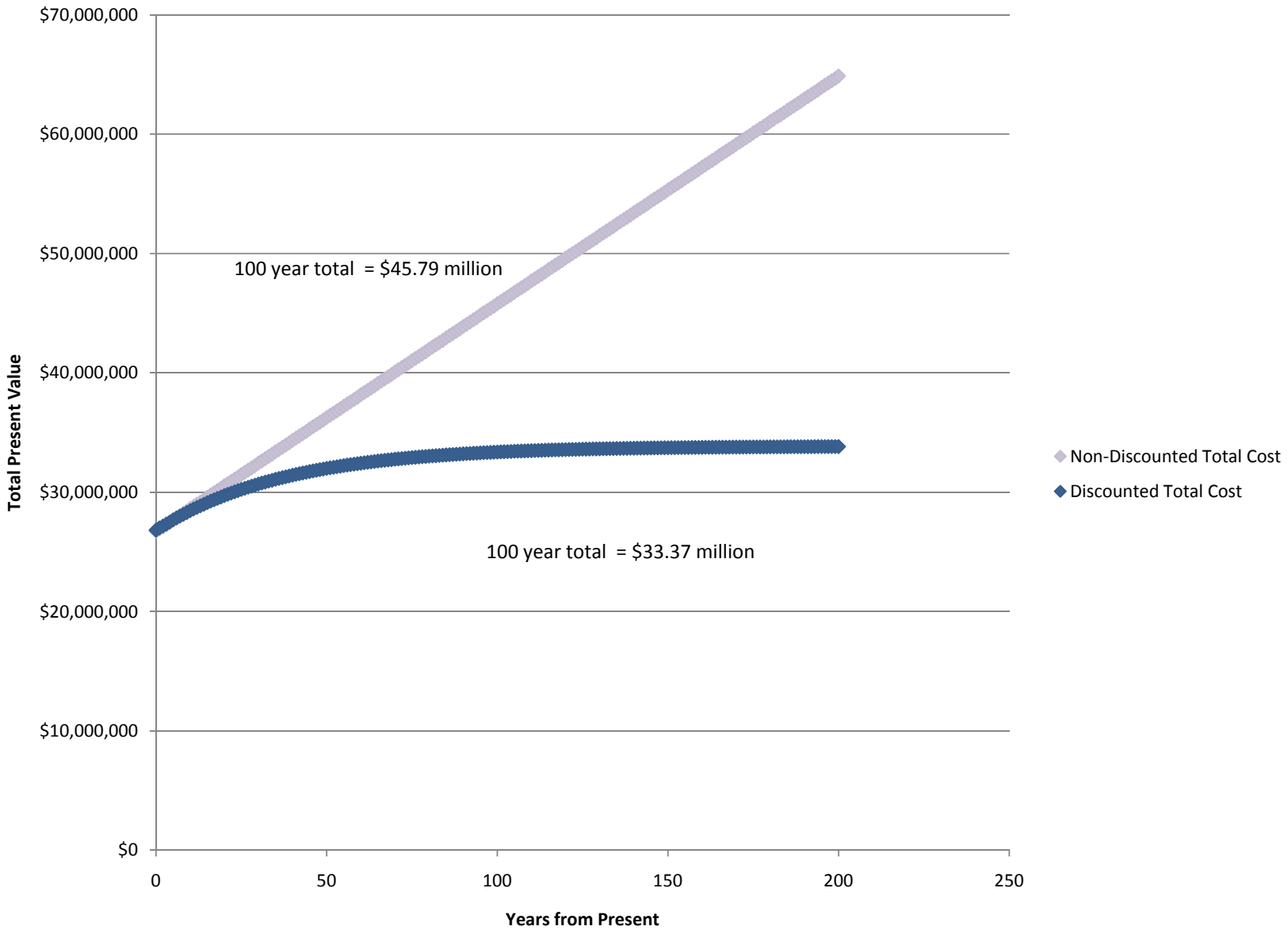


Figure F-7. Alternative SW-8 Non-Discounted versus Discounted Total Costs - Cost Estimates, UC Davis LEHR/OCL

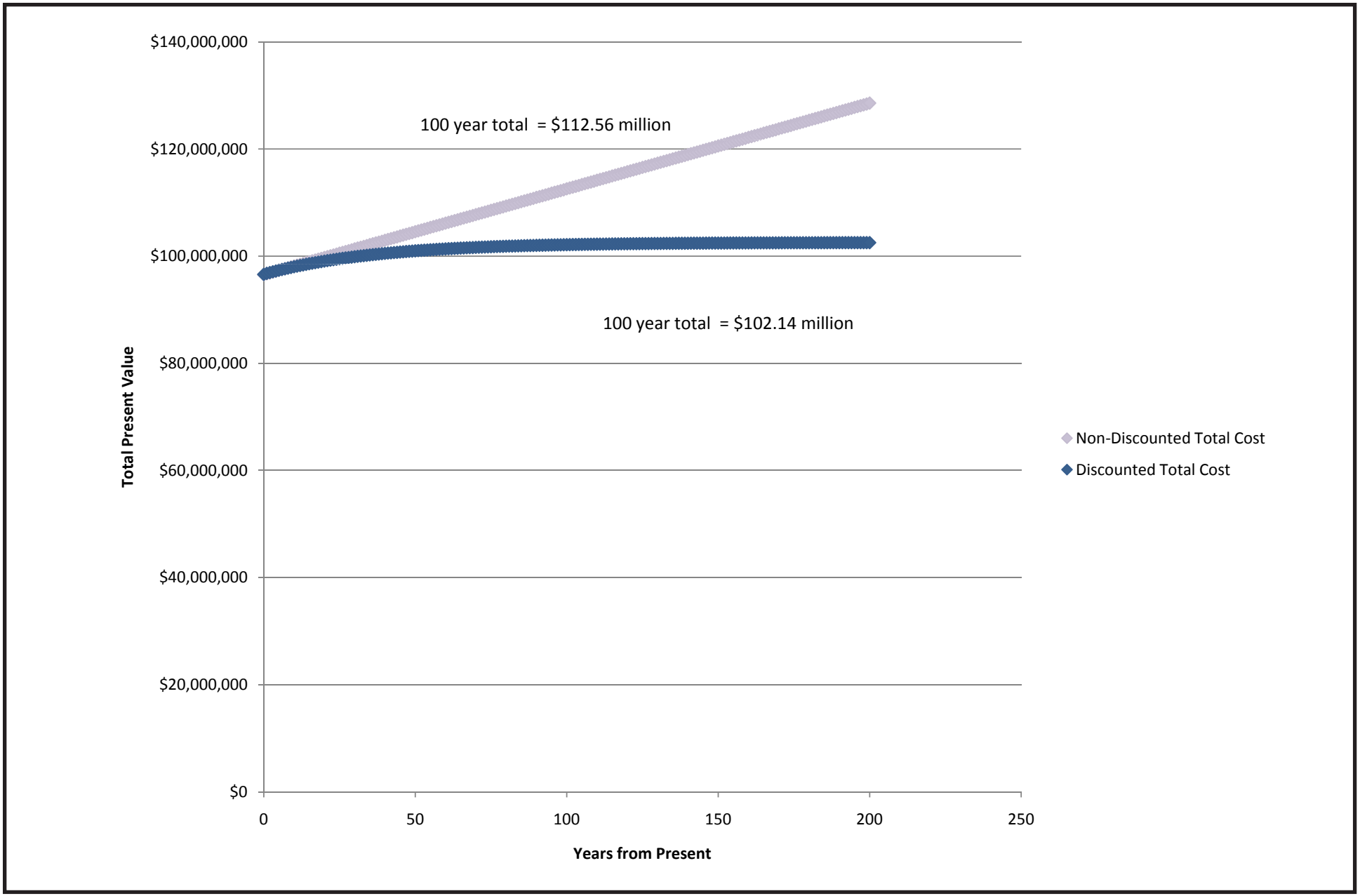


Figure F-8. Alternative SW-9 Non-Discounted versus Discounted Total Costs - Cost Estimates, UC Davis LEHR/OCL

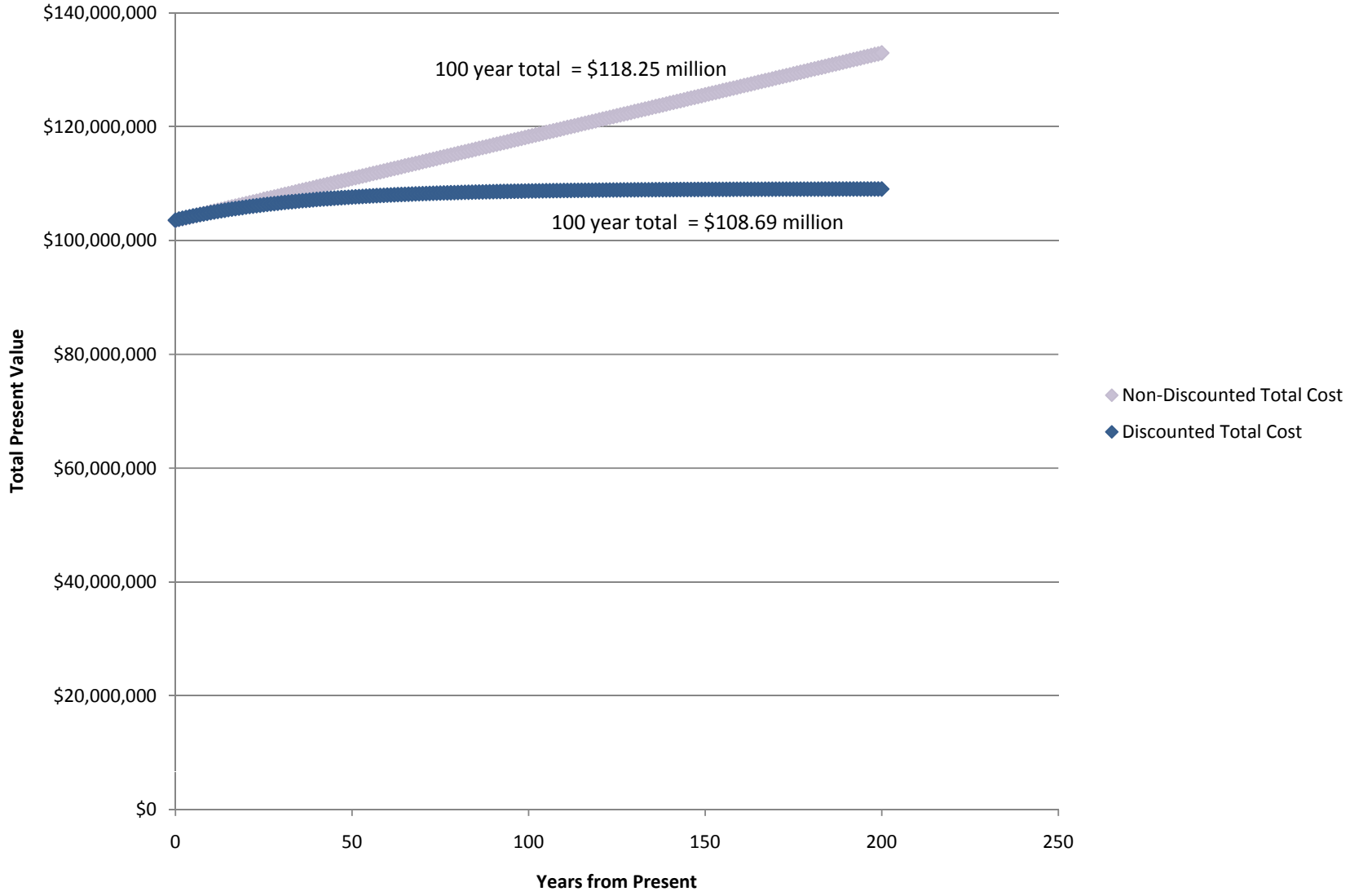


Figure F-9. Alternative SW-10 Non-Discounted versus Discounted Total Costs - Cost Estimates, UC Davis LEHR/OCL

TABLES

Table F-1. Alternative SW-2 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

Institutional Controls and Groundwater Monitoring

	Cost Component	Base Year	Year 1 (base year dollars)	Year 2 (base year dollars)	Future Costs (base year dollars)	Frequency	TOTAL (present value)
CAPITAL COSTS:	Data Gap Investigation	$157,394	---	---	---	---	$157,394
	Decontamination Facilities [a]	$37,879	---	---	---	---	$37,879
	Install New Groundwater Wells [b]	$115,168	---	---	---	---	$115,168
	Off-Site Transportation and Disposal	$8,339	---	---	---	---	$8,339
	TOTAL CAPITAL COST						**$318,780**
O&M COSTS:	Institutional Controls	$328,407	$23,696	---	$23,696	annual	$1,144,900
	Groundwater and Storm Water Monitoring [b]	$322,702	$205,025	---	$129,944	annual	$4,873,320
	TOTAL O&M COST						**$6,018,220**
PERIODIC COSTS:	Five-Year Reviews	---	---	---	$26,542	every five years	$173,297
	TOTAL PERIODIC COST						**$173,297**
TOTAL PRESENT VALUE OF ALTERNATIVE [c]							**$6,510,297**

Notes:

Totaled values are rounded up to the nearest whole dollar.

[a] Decontamination Facilities include temporary facilities for decontamination of personnel and equipment; cost is proportional to the duration of the remedial action (one construction season or less in Alternatives SW-2 through SW-7 and two construction seasons in Alternatives SW-8, SW-9, and SW-10).

[b] Table 5-3 lists Site wells to be decommissioned, monitored, and constructed for each alternative.

[c] Discount factor for present value analysis is 2.7%; the period of analysis is 100 years.

Acronyms/Abbreviations:

O&M - operations and maintenance

Table F-2. Alternative SW-3 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

VOC "Hot Spot" Removal, Three On-Site Corrective Action Management Units with Graded Covers, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring

	Cost Component	Base Year	Year 1 (base year dollars)	Year 2 (base year dollars)	Future Costs (base year dollars)	Frequency	TOTAL (present value)
CAPITAL COSTS:							
Pre-Remediation	Biological Survey	$86,304	---	---	---	---	$86,304
	Elderberry Mitigation	$270,000	---	---	---	---	$270,000
	Data Gap Investigation	$157,394	---	---	---	---	$157,394
	Decontamination Facilities [a]	$195,984	---	---	---	---	$195,984
	Building D&D (including disposal)	$94,688	---	---	---	---	$94,688
	Clearing and Grubbing	$52,025	---	---	---	---	$52,025
Excavation and Backfill	ET PTW and Exploratory Trench Excavation [b]	$125,480	---	---	---	---	$125,480
	LFU-1 PTW and Exploratory Trench Excavation [b]	$285,662	---	---	---	---	$285,662
	LFU-2 PTW and Exploratory Trench Excavation [b]	$310,177	---	---	---	---	$310,177
	LFU-3 PTW and Exploratory Trench Excavation [b]	$72,889	---	---	---	---	$72,889
	ET VOC "Hot Spot" Excavation	$234,122	---	---	---	---	$234,122
	LFU-2 VOC "Hot Spot" Excavation	$196,258	---	---	---	---	$196,258
Materials Management and Disposal	Materials Management [c]	$472,652	---	---	---	---	$472,652
	Off-Site Transportation and Disposal	$2,291,553	---	---	---	---	$2,291,553
CAMU Construction	LFU-1 Graded Cover	$256,367	---	---	---	---	$256,367
	LFU-2/ET/WBH Graded Cover	$383,333	---	---	---	---	$383,333
	LFU-3 Graded Cover	$88,118	---	---	---	---	$88,118
Post-Remediation	Install New Groundwater Wells [d]	$118,168	---	---	---	---	$118,168
	Storm Drainage [e]	$691,009	---	---	---	---	$691,009
	LFU-1 Drainage Channel	$29,823	---	---	---	---	$29,823
	LFU-3 Drainage Channels	$51,820	---	---	---	---	$51,820
	TOTAL CAPITAL COST						**$6,463,826**
O&M COSTS:	Institutional Controls	$328,407	$23,696	$23,696	$23,696	annual	$1,144,900
	Groundwater and Storm Water Monitoring [d]	$283,904	$182,478	$117,125	$117,125	annual	$4,873,320
	O&M Drainage System [f]	---	---	$6,000	$6,000	annual	$200,901
	O&M of Graded Areas	---	---	$8,889	$21,335	annual	$702,560
	TOTAL O&M COST						**$6,921,681**
PERIODIC COSTS:	Periodic Storm Water Lift Station Repair	---	---	---	$4,012	every ten years	$12,225
	Five-Year Reviews	---	---	---	$26,542	every five years	$173,297
	TOTAL PERIODIC COST						**$185,523**
TOTAL PRESENT VALUE OF ALTERNATIVE [g]							**$13,571,030**
ST and HFSDA Graded Cover Contingency							$44,059
TOTAL PRESENT VALUE OF ALTERNATIVE with contingency							**$13,615,089**

Notes:

Totaled values are rounded up to the nearest whole dollar.

[a] Decontamination Facilities include temporary facilities for decontamination of personnel and equipment; cost is proportional to the duration of the remedial action (one construction season or less in Alternatives SW-2 through SW-7 and two construction seasons in Alternatives SW-8, SW-9, and SW-10).

[b] PTW and Exploratory Trench Excavation includes the cost of a geophysical survey to be performed prior to excavation.

[c] Materials Management includes the cost of stockpiling and management of excavated materials, waste characterization sampling, and sifting/sorting waste streams.

Table F-2. Alternative SW-3 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

Notes (continued):

[d] Table 5-3 lists Site wells to be decommissioned, monitored, and constructed for each alternative.

[e] Storm drainage includes costs of storm water detention basins and infrastructure for storm water conveyance from graded cover areas to the detention basins and final discharge.

[f] O&M Drainage System includes O&M costs for storm water detention basins and associated infrastructure, in addition to storm water drainage channels/swales.

[g] Discount factor for present value analysis is 2.7%; the period of analysis is 100 years.

Acronyms/Abbreviations:
CAMU - corrective action management unit
D&D - decommissioning and demolition
ET - Eastern Trenches
HFSDA - Hopland Field Station Disposal Area
LFU - landfill unit
O&M - operations and maintenance
PTW - principal threat waste
ST - Southern Trenches
VOC - volatile organic compound
WBH - Waste Burial Holes

Table F-3. Alternative SW-4 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

VOC "Hot Spot" Removal, Three On-Site Corrective Action Management Units with Evapotranspiration Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring

	Cost Component	Base Year	Year 1 (base year dollars)	Year 2 (base year dollars)	Future Costs (base year dollars)	Frequency	TOTAL (present value)
CAPITAL COSTS:							
Pre-Remediation	Biological Survey	$86,304	---	---	---	---	$86,304
	Elderberry Mitigation	$270,000	---	---	---	---	$270,000
	Data Gap Investigation	$157,394	---	---	---	---	$157,394
	Decontamination Facilities [a]	$582,436	---	---	---	---	$582,436
	Building D&D (including disposal)	$314,966	---	---	---	---	$314,966
	Decommission Groundwater Wells [b]	$624,402	---	---	---	---	$624,402
	Clearing and Grubbing	$52,025	---	---	---	---	$52,025
	Demolish LFU-3 N-S Drainage Channel	$5,026	---	---	---	---	$5,026
Excavation and Backfill	ET PTW and Exploratory Trench Excavation [c]	$118,150	---	---	---	---	$118,150
	LFU-1 PTW and Exploratory Trench Excavation [c]	$278,207	---	---	---	---	$278,207
	LFU-2 PTW and Exploratory Trench Excavation [c]	$300,782	---	---	---	---	$300,782
	LFU-3 PTW and Exploratory Trench Excavation [c]	$71,311	---	---	---	---	$71,311
	ET VOC "Hot Spot" Excavation	$181,700	---	---	---	---	$181,700
	LFU-1 Drainage Area Excavation	$609,893	---	---	---	---	$609,893
	LFU-2 VOC "Hot Spot" Excavation	$47,289	---	---	---	---	$47,289
	LFU-3 Drainage Area Excavation	$269,681	---	---	---	---	$269,681
Materials Management	Materials Management [d]	$1,078,201	---	---	---	---	$1,078,201
and Disposal	Excavated Material Consolidation [e]	$45,243	---	---	---	---	$45,243
	Off-Site Transportation and Disposal	$2,386,533	---	---	---	---	$2,386,533
CAMU Construction	LFU-1 Cap	$775,270	---	---	---	---	$775,270
	LFU-2/ET/WBH Cap	$1,323,777	---	---	---	---	$1,323,777
	LFU-3 Cap	$298,888	---	---	---	---	$298,888
Post-Remediation	Install New Groundwater Wells [b]	$297,551	---	---	---	---	$297,551
	Storm Drainage [f]	$687,484	---	---	---	---	$687,484
	LFU-1 Drainage Swale	$18,841	---	---	---	---	$18,841
	LFU-3 Drainage Channels	$116,775	---	---	---	---	$116,775
	Building Reconstruction [g]	$423,616	---	---	---	---	$423,616
	TOTAL CAPITAL COST						**$11,421,744**
O&M COSTS:	Institutional Controls	$328,407	$23,696	$23,696	$23,696	annual	$1,144,900
	Groundwater and Storm Water Monitoring [b]	$283,904	$161,496	$105,283	$105,283	annual	$4,383,323
	O&M Drainage System [h]	---	---	$6,000	$6,000	annual	$200,901
	O&M of Caps	---	---	$14,733	$35,359	annual	$1,164,386
	TOTAL O&M COST						**$6,893,510**
PERIODIC COSTS:	Periodic Storm Water Lift Station Repair	---	---	---	$4,012	every ten years	$12,225
	Five-Year Reviews	---	---	---	$26,542	every five years	$173,297
	TOTAL PERIODIC COST						**$185,523**
TOTAL PRESENT VALUE OF ALTERNATIVE [i]							**$18,500,777**
ST and HFSDA Evapotranspiration Cap Contingency							$149,444
TOTAL PRESENT VALUE OF ALTERNATIVE with contingency							**$18,650,222**

Table F-3. Alternative SW-4 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

Notes:

Totaled values are rounded up to the nearest whole dollar.

[a] Decontamination Facilities include temporary facilities for decontamination of personnel and equipment; cost is proportional to the duration of the remedial action (one construction season or less in Alternatives SW-2 through SW-7 and two construction seasons in Alternatives SW-8, SW-9, and SW-10).

[b] Table 5-3 lists Site wells to be decommissioned, monitored, and constructed for each alternative.

[c] PTW and Exploratory Trench Excavation includes the cost of a geophysical survey to be performed prior to excavation.

[d] Materials Management includes the cost of stockpiling and management of excavated materials, waste characterization sampling, and sifting/sorting waste streams.

[e] Excavated Material Consolidation includes the cost of consolidating non-PTW excavated material from on-Site excavations within the footprints of on-Site CAMUs and beneath the final caps.

[f] Storm drainage includes costs of storm water detention basins and infrastructure for storm water conveyance from capped areas to the detention basins and final discharge.

[g] Building Reconstruction cost includes the cost of constructing three warehouse type buildings at the Site, intended to replace the Geriatrics buildings (H-292 and H-293) and buildings H-253 and H-290.

[h] O&M Drainage System includes O&M costs for storm water detention basins and associated infrastructure, in addition to storm water drainage channels/swales.

[i] Discount factor for present value analysis is 2.7%; the period of analysis is 100 years.

Acronyms/Abbreviations:

CAMU - corrective action management unit
D&D - decommissioning and demolition
ET - Eastern Trenches
HFSDA - Hopland Field Station Disposal Area
LFU - landfill unit
N-S - north-south
O&M - operations and maintenance
PTW - principal threat waste
ST - Southern Trenches
VOC - volatile organic compound
WBH - Waste Burial Holes

Table F-4. Alternative SW-5 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

VOC "Hot Spot" Removal, Three On-Site Corrective Action Management Units with Asphalt Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring

	Cost Component	Base Year	Year 1 (base year dollars)	Year 2 (base year dollars)	Future Costs (base year dollars)	Frequency	TOTAL (present value)
CAPITAL COSTS:							
Pre-Remediation	Biological Survey	$86,304	---	---	---	---	$86,304
	Elderberry Mitigation	$270,000	---	---	---	---	$270,000
	Data Gap Investigation	$157,394	---	---	---	---	$157,394
	Decontamination Facilities[a]	$582,436	---	---	---	---	$582,436
	Building D&D (including disposal)	$314,966	---	---	---	---	$314,966
	Decommission Groundwater Wells[b]	$624,402	---	---	---	---	$624,402
	Clearing and Grubbing	$52,025	---	---	---	---	$52,025
	Demolish LFU-3 N-S Drainage Channel	$5,026	---	---	---	---	$5,026
Excavation and Backfill	ET PTW and Exploratory Trench Excavation[c]	$118,150	---	---	---	---	$118,150
	LFU-1 PTW and Exploratory Trench Excavation[c]	$278,207	---	---	---	---	$278,207
	LFU-2 PTW and Exploratory Trench Excavation[c]	$300,782	---	---	---	---	$300,782
	LFU-3 PTW and Exploratory Trench Excavation[c]	$71,311	---	---	---	---	$71,311
	ET VOC "Hot Spot" Excavation	$181,700	---	---	---	---	$181,700
	LFU-1 Drainage Area Excavation	$609,893	---	---	---	---	$609,893
	LFU-2 VOC "Hot Spot" Excavation	$47,289	---	---	---	---	$47,289
	LFU-3 Drainage Area Excavation	$269,681	---	---	---	---	$269,681
Materials Management and Disposal	Materials Management[d]	$1,078,201	---	---	---	---	$1,078,201
	Excavated Material Consolidation[e]	$45,243	---	---	---	---	$45,243
	Off-Site Transportation and Disposal	$2,386,533	---	---	---	---	$2,386,533
CAMU Construction	LFU-1 Cap	$1,250,719	---	---	---	---	$1,250,719
	LFU-2/ET/WBH Cap	$2,183,121	---	---	---	---	$2,183,121
	LFU-3 Cap	$466,033	---	---	---	---	$466,033
Post-Remediation	Install New Groundwater Wells[b]	$297,551	---	---	---	---	$297,551
	Storm Drainage[f]	$707,262	---	---	---	---	$707,262
	LFU-1 Drainage Swale	$18,841	---	---	---	---	$18,841
	LFU-3 Drainage Channels	$116,775	---	---	---	---	$116,775
	Building Reconstruction[g]	$423,616	---	---	---	---	$423,616
	TOTAL CAPITAL COST						**$12,943,460**
O&M COSTS:	Institutional Controls	$328,407	$23,696	$23,696	$23,696	annual	$1,144,900
	Groundwater and Storm Water Monitoring[b]	$283,904	$161,496	$105,283	$105,283	annual	$4,383,323
	O&M Drainage System[h]	---	---	$6,000	$6,000	annual	$200,901
	O&M of Caps	---	---	$25,758	$61,820	annual	$2,035,744
	TOTAL O&M COST						**$7,764,868**
PERIODIC COSTS:	Periodic Storm Water Lift Station Repair	---	---	---	$4,012	every ten years	$12,225
	Five-Year Reviews	---	---	---	$26,542	every five years	$173,297
	TOTAL PERIODIC COST						**$185,523**
TOTAL PRESENT VALUE OF ALTERNATIVE[i]							**$20,893,851**
ST and HFSDA Asphalt Cap Contingency							$233,016
TOTAL PRESENT VALUE OF ALTERNATIVE with contingency							**$21,126,868**

Notes:

Totaled values are rounded up to the nearest whole dollar.

[a] Decontamination Facilities include temporary facilities for decontamination of personnel and equipment; cost is proportional to the duration of the remedial action (one construction season or less in Alternatives SW-2 through SW-7 and two construction seasons in Alternatives SW-8, SW-9, and SW-10).

Table F-4. Alternative SW-5 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

Notes (continued):

[b] Table 5-3 lists Site wells to be decommissioned, monitored, and constructed for each alternative.

[c] PTW and Exploratory Trench Excavation includes the cost of a geophysical survey to be performed prior to excavation.

[d] Materials Management includes the cost of stockpiling and management of excavated materials, waste characterization sampling, and sifting/sorting waste streams.

[e] Excavated Material Consolidation includes the cost of consolidating non-PTW excavated material from on-Site excavations within the footprints of on-Site CAMUs and beneath the final caps.

[f] Storm drainage includes costs of storm water detention basins and infrastructure for storm water conveyance from capped areas to the detention basins and final discharge.

[g] Building Reconstruction cost includes the cost of constructing three warehouse type buildings at the Site, intended to replace the Geriatrics buildings (H-292 and H-293) and buildings H-253 and H-290.

[h] O&M Drainage System includes O&M costs for storm water detention basins and associated infrastructure, in addition to storm water drainage channels/swales.

[i] Discount factor for present value analysis is 2.7%; the period of analysis is 100 years.

Acronyms/Abbreviations:

CAMU - corrective action management uni
D&D - decommissioning and demolition
ET - Eastern Trenches
HFSDA - Hopland Field Station Disposal Area
LFU - landfill unit
N-S - north-south
O&M - operations and maintenance
PTW - principal threat waste
ST - Southern Trenches
VOC - volatile organic compound
WBH - Waste Burial Holes

Table F-5. Alternative SW-6 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

VOC "Hot Spot" Removal, Three On-Site Corrective Action Management Units with Multiple-Layer Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring

	Cost Component	Base Year	Year 1 (base year dollars)	Year 2 (base year dollars)	Future Costs (base year dollars)	Frequency	TOTAL (present value)
CAPITAL COSTS:							
Pre-Remediation	Biological Survey	$86,304	---	---	---	---	$86,304
	Elderberry Mitigation	$270,000	---	---	---	---	$270,000
	Data Gap Investigation	$157,394	---	---	---	---	$157,394
	Decontamination Facilities [a]	$582,436	---	---	---	---	$582,436
	Building D&D (including disposal)	$314,966	---	---	---	---	$314,966
	Decommission Groundwater Wells [b]	$624,402	---	---	---	---	$624,402
	Clearing and Grubbing	$52,025	---	---	---	---	$52,025
	Demolish LFU-3 N-S Drainage Channel	$5,026	---	---	---	---	$5,026
Excavation and Backfill	LFU-1 PTW and Exploratory Trench Excavation [c]	$278,207	---	---	---	---	$278,207
	LFU-2 PTW and Exploratory Trench Excavation [c]	$300,782	---	---	---	---	$300,782
	LFU-3 PTW and Exploratory Trench Excavation [c]	$71,311	---	---	---	---	$71,311
	ET Excavation [d]	$273,170	---	---	---	---	$273,170
	ET VOC "Hot Spot" Excavation	$181,700	---	---	---	---	$181,700
	LFU-1 Drainage Area Excavation	$609,893	---	---	---	---	$609,893
	LFU-2 VOC "Hot Spot" Excavation	$47,289	---	---	---	---	$47,289
	LFU-3 Drainage Area Excavation	$269,681	---	---	---	---	$269,681
Materials Management and Disposal	Materials Management [e]	$1,548,268	---	---	---	---	$1,548,268
	Excavated Material Consolidation [f]	$50,438	---	---	---	---	$50,438
	Off-Site Transportation and Disposal	$2,425,318	---	---	---	---	$2,425,318
CAMU Construction	LFU-1 Cap	$1,113,709	---	---	---	---	$1,113,709
	LFU-2/ET/WBH Cap	$1,861,724	---	---	---	---	$1,861,724
	LFU-3 Cap	$408,092	---	---	---	---	$408,092
Post-Remediation	Install New Groundwater Wells [b]	$297,551	---	---	---	---	$297,551
	Storm Drainage [g]	$687,484	---	---	---	---	$687,484
	LFU-1 Drainage Swale	$18,841	---	---	---	---	$18,841
	LFU-3 Drainage Channels	$116,775	---	---	---	---	$116,775
	Building Reconstruction [h]	$423,616	---	---	---	---	$423,616
	TOTAL CAPITAL COST						**$13,076,401**
O&M COSTS:	Institutional Controls	$328,407	$23,696	$23,696	$23,696	annual	$1,144,900
	Groundwater and Storm Water Monitoring [b]	$283,904	$161,496	$105,283	$105,283	annual	$4,383,323
	O&M Drainage System [i]	---	---	$6,000	$6,000	annual	$200,901
	O&M of Caps	---	---	$16,455	$39,492	annual	$1,300,501
	TOTAL O&M COST						**$7,029,624**
PERIODIC COSTS:	Periodic Storm Water Lift Station Repair	---	---	---	$4,012	every ten years	$12,225
	Five-Year Reviews	---	---	---	$26,542	every five years	$173,297
	TOTAL PERIODIC COST						**$185,523**
TOTAL PRESENT VALUE OF ALTERNATIVE [j]							**$20,291,548**
ST and HFSDA Multiple-Layer Cap Contingency							$204,046
TOTAL PRESENT VALUE OF ALTERNATIVE with contingency							**$20,495,595**

Notes:

Totaled values are rounded up to the nearest whole dollar.

[a] Decontamination Facilities include temporary facilities for decontamination of personnel and equipment; cost is proportional to the duration of the remedial action (one construction season or less in Alternatives SW-2 through SW-7 and two construction seasons in Alternatives SW-8, SW-9, and SW-10).

Table F-5. Alternative SW-6 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

Notes (continued):

[b] Table 5-3 lists Site wells to be decommissioned, monitored, and constructed for each alternative.

[c] PTW and Exploratory Trench Excavation includes the cost of a geophysical survey to be performed prior to excavation.

[d] The ET PTW and Exploratory Trenches will be excavated as part of the ET excavation.

[e] Materials Management includes the cost of stockpiling and management of excavated materials, waste characterization sampling, and sifting/sorting waste streams.

[f] Excavated Material Consolidation includes the cost of consolidating non-PTW excavated material from on-Site excavations within the footprints of on-Site CAMUs and beneath the final caps.

[g] Storm drainage includes costs of storm water detention basins and infrastructure for storm water conveyance from capped areas to the detention basins and final discharge.

[h] Building Reconstruction cost includes the cost of constructing three warehouse type buildings at the Site, intended to replace the Geriatrics buildings (H-292 and H-293) and buildings H-253 and H-290.

[i] O&M Drainage System includes O&M costs for storm water detention basins and associated infrastructure, in addition to storm water drainage channels/swales.

[j] Discount factor for present value analysis is 2.7%; the period of analysis is 100 years.

Acronyms/Abbreviations:

CAMU - corrective action management unit
D&D - decommissioning and demolition
ET - Eastern Trenches
HFSDA - Hopland Field Station Disposal Area
LFU - landfill unit
N-S - north-south
O&M - operations and maintenance
PTW - principal threat waste
ST - Southern Trenches
VOC - volatile organic compound
WBH - Waste Burial Holes

Table F-6. Alternative SW-7 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

VOC "Hot Spot" Removal, Two On-Site Corrective Action Management Units with Multiple-Layer Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring

	Cost Component	Base Year	Year 1 (base year dollars)	Year 2 (base year dollars)	Future Costs (base year dollars)	Frequency	TOTAL (present value)
CAPITAL COSTS:							
Pre-Remediation	Biological Survey	$86,304	---	---	---	---	$86,304
	Elderberry Mitigation	$270,000	---	---	---	---	$270,000
	Decontamination Facilities [a]	$582,436	---	---	---	---	$582,436
	Building D&D (including disposal)	$314,966	---	---	---	---	$314,966
	Decommission Groundwater Wells [b]	$624,402	---	---	---	---	$624,402
	Clearing and Grubbing	$54,151	---	---	---	---	$54,151
	Demolish LFU-3 N-S Drainage Channel	$10,264	---	---	---	---	$10,264
Excavation and Backfill	LFU-1 PTW and Exploratory Trench Excavation [c]	$278,207	---	---	---	---	$278,207
	LFU-2 PTW and Exploratory Trench Excavation [c]	$300,782	---	---	---	---	$300,782
	ET Excavation [d]	$273,170	---	---	---	---	$273,170
	ET VOC "Hot Spot" Excavation	$181,700	---	---	---	---	$181,700
	LFU-1 Drainage Area Excavation	$609,893	---	---	---	---	$609,893
	LFU-2 VOC "Hot Spot" Excavation	$47,289	---	---	---	---	$47,289
	LFU-3 Excavation [e]	$893,073	---	---	---	---	$893,073
	ST and HFSDA Excavation	$206,155	---	---	---	---	$206,155
Materials Management and Disposal	Materials Management [f]	$2,143,896	---	---	---	---	$2,143,896
	Excavated Material Consolidation [g]	$87,682	---	---	---	---	$87,682
	Off-Site Transportation and Disposal	$2,590,911	---	---	---	---	$2,590,911
CAMU Construction	LFU-1 Cap	$1,113,709	---	---	---	---	$1,113,709
	LFU-2/ET/WBH Cap	$1,861,724	---	---	---	---	$1,861,724
Post-Remediation	Install New Groundwater Wells [b]	$297,551	---	---	---	---	$297,551
	Storm Drainage [h]	$474,347	---	---	---	---	$474,347
	LFU-1 Drainage Swale	$18,841	---	---	---	---	$18,841
	LFU-3 Drainage Channels	$91,540	---	---	---	---	$91,540
	Building Reconstruction [i]	$423,616	---	---	---	---	$423,616
	TOTAL CAPITAL COST						**$13,836,609**
O&M COSTS:	Institutional Controls	$328,407	$23,696	$23,696	$23,696	annual	$1,144,900
	Groundwater and Storm Water Monitoring [b]	$283,904	$161,496	$105,283	$105,283	annual	$4,383,323
	O&M Drainage System [j]	---	---	$4,000	$4,000	annual	$133,934
	O&M of Caps	---	---	$14,932	$35,836	annual	$1,180,095
	TOTAL O&M COST						**$6,842,252**
PERIODIC COSTS:	Periodic Storm Water Lift Station Repair	---	---	---	$2,674	every ten years	$8,150
	Five-Year Reviews	---	---	---	$26,542	every five years	$173,297
	TOTAL PERIODIC COST						**$181,448**
TOTAL PRESENT VALUE OF ALTERNATIVE [k]							**$20,860,309**

Table F-6. Alternative SW-7 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

Notes:

Totaled values are rounded up to the nearest whole dollar.

[a] Decontamination Facilities include temporary facilities for decontamination of personnel and equipment; cost is proportional to the duration of the remedial action (one construction season or less in Alternatives SW-2 through SW-7 and two construction seasons in Alternatives SW-8, SW-9, and SW-10).

[b] Table 5-3 lists Site wells to be decommissioned, monitored, and constructed for each alternative.

[c] PTW and Exploratory Trench Excavation includes the cost of a geophysical survey to be performed prior to excavation.

[d] The ET PTW and Exploratory Trenches will be excavated as part of the ET excavation.

[e] The LFU-3 Drainage Area is included in the LFU-3 Excavation cost component.

[f] Materials Management includes the cost of stockpiling and management of excavated materials, waste characterization sampling, and sifting/sorting waste streams.

[g] Excavated Material Consolidation includes the cost of consolidating non-PTW excavated material from on-Site excavations within the footprints of on-Site CAMUs and beneath the final caps.

[h] Storm drainage includes costs of storm water detention basins and infrastructure for storm water conveyance from capped areas to the detention basins and final discharge.

[i] Building Reconstruction cost includes the cost of constructing three warehouse type buildings at the Site, intended to replace the Geriatrics buildings (H-292 and H-293) and buildings H-253 and H-290.

[j] O&M Drainage System includes O&M costs for storm water detention basins and associated infrastructure, in addition to storm water drainage channels/swales.

[k] Discount factor for present value analysis is 2.7%; the period of analysis is 100 years.

Acronyms/Abbreviations:

CAMU - corrective action management unit
D&D - decommissioning and demolition
ET - Eastern Trenches
HFSDA - Hopland Field Station Disposal Area
LFU - landfill unit
N-S - north-south
O&M - operations and maintenance
PTW - principal threat waste
ST - Southern Trenches
VOC - volatile organic compound
WBH - Waste Burial Holes

Table F-7. Alternative SW-8 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

VOC "Hot Spot" Removal, One On-Site Lined Corrective Action Management Unit with Multiple-Layer Cap, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring

	Cost Component	Base Year	Year 1 (base year dollars)	Year 2 (base year dollars)	Future Costs (base year dollars)	Frequency	TOTAL (present value)
CAPITAL COSTS:							
Pre-Remediation	Biological Survey	$86,304	---	---	---	---	$86,304
	Elderberry Mitigation	$270,000	---	---	---	---	$270,000
	Decontamination Facilities [a]	$1,157,352	---	---	---	---	$1,157,352
	Building D&D (including disposal)	$314,966	---	---	---	---	$314,966
	Decommission Groundwater Wells [b]	$631,623	---	---	---	---	$631,623
	Clearing and Grubbing	$60,339	---	---	---	---	$60,339
	Demolish LFU-3 N-S Drainage Channel	$10,264	---	---	---	---	$10,264
Excavation and Backfill [c]	ET Excavation [d]	$301,634	---	---	---	---	$301,634
	ET VOC "Hot Spot" Excavation	$174,189	---	---	---	---	$174,189
	LFU-1 Excavation [e]	$952,602	---	---	---	---	$952,602
	LFU-2 Excavation [f]	---	$1,010,770	---	---	---	$1,010,770
	LFU-3 Excavation [g]	$230,423	---	---	---	---	$230,423
	ST and HFSDA Excavation	$78,337	---	---	---	---	$78,337
	Non-Impacted Area Excavation	---	$568,546	---	---	---	$568,546
Materials Management and Disposal	Materials Management [h]	$7,157,613	---	---	---	---	$7,157,613
	Excavated Material Consolidation [i]	$700,300	---	---	---	---	$700,300
	Off-Site Transportation and Disposal	$3,778,710	---	---	---	---	$3,778,710
CAMU Construction	Multiple-Layer Cap With Liner and LCRS	---	$7,455,403	---	---	---	$7,455,403
Post-Remediation	Install New Groundwater Wells [b]	---	$288,862	---	---	---	$288,862
	Storm Drainage [j]	---	$476,807	---	---	---	$476,807
	LFU-1 Drainage Swale	---	$18,841	---	---	---	$18,841
	LFU-3 Drainage Channels	$91,540	---	---	---	---	$91,540
	Building Reconstruction [k]	---	$423,616	---	---	---	$423,616
	TOTAL CAPITAL COST						**$26,239,041**
O&M COSTS:	Institutional Controls	$328,407	$23,696	$23,696	$23,696	annual	$1,144,900
	Groundwater and Storm Water Monitoring [b]	$256,531	$135,072	$90,282	$90,282	annual	$4,040,774
	O&M Drainage System [l]	---	---	$4,000	$4,000	annual	$133,934
	O&M of Caps	---	---	$17,451	$41,883	annual	$1,379,232
	O&M of Leachate Collection and Recovery System	---	$1,236	$7,413	$7,413	annual	$249,432
	TOTAL O&M COST						**$6,948,273**
PERIODIC COSTS:	Periodic Storm Water Lift Station Repair	---	---	---	$2,674	every ten years	$8,150
	Five-Year Reviews	---	---	---	$26,542	every five years	$173,297
	TOTAL PERIODIC COST						**$181,448**
TOTAL PRESENT VALUE OF ALTERNATIVE [m]							**$33,368,762**
Non-Impacted Area Disposal and Import Fill Contingency [n]							$6,992,711
TOTAL PRESENT VALUE OF ALTERNATIVE with contingency							**$40,361,473**

Notes:

Totaled values are rounded up to the nearest whole dollar.

[a] Decontamination Facilities include temporary facilities for decontamination of personnel and equipment; cost is proportional to the duration of the remedial action (one construction season or less in Alternatives SW-2 through SW-7 and two construction seasons in Alternatives SW-8, SW-9, and SW-10).

Table F-7. Alternative SW-8 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

Notes (continued):

[b] Table 5-3 lists Site wells to be decommissioned, monitored, and constructed for each alternative.

[c] Under Alternative SW-8, excavation and backfill costs are calculated differently from those in other alternatives. For excavations occurring within the footprint of the liner and cap, backfilling of excavated material into the lined CAMU is costed separately under "Excavated Material Consolidation," whereas in areas outside the cap footprint and in other alternatives, the cost of backfilling is included in the excavation cost component. For areas outside the footprint of the liner and cap, the excavated areas are assumed to receive clean backfill from an on-Site source (non-impacted area), thus lowering the cost in comparison to other alternatives.

[d] The ET PTW and Exploratory Trenches will be excavated as part of the ET excavation.

[e] The LFU-1 PTW and Exploratory Trenches and the LFU-1 Drainage Area will be excavated as part of the LFU-1 excavation.

[f] The LFU-2 PTW and Exploratory Trenches and LFU-2 VOC "Hot Spot" will be excavated as part of the LFU-2 excavation.

[g] The LFU-3 PTW and Exploratory Trenches and LFU-3 Drainage Area will be excavated as part of the LFU-3 excavation.

[h] Materials Management includes the cost of stockpiling and management of excavated materials, waste characterization sampling, and sifting/sorting waste streams.

[i] Excavated Material Consolidation includes the cost of consolidating non-PTW excavated material from on-Site excavations within the footprint of the on-Site CAMU and beneath the final cap.

[j] Storm drainage includes costs of storm water detention basins and infrastructure for storm water conveyance from capped areas to the detention basins and final discharge.

[k] Building Reconstruction cost includes the cost of constructing three warehouse type buildings at the Site, intended to replace the Geriatrics buildings (H-292 and H-293) and buildings H-253 and H-290.

[l] O&M Drainage System includes O&M costs for storm water detention basins and associated infrastructure, in addition to storm water drainage channels/swales.

[m] Discount factor for present value analysis is 2.7%; the period of analysis is 100 years.

[n] The contingent action cost for Alternative SW-8 includes the disposal of the material from the Non-Impacted Area as Non-RCRA hazardous waste, and import of clean fill sufficient for backfill of on-Site excavated areas.

Acronyms/Abbreviations:

CAMU - corrective action management unit
D&D - decommissioning and demolition
ET - Eastern Trenches
HFSDA - Hopland Field Station Disposal Area
LCRS - leachate collection and recovery system
LFU - landfill unit
N-S - north-south
O&M - operations and maintenance
PTW - principal threat waste
RCRA - Resource Conservation and Recovery Act
ST - Southern Trenches
VOC - volatile organic compound

Table F-8. Alternative SW-9 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

Excavate and Dispose of Waste Off-Site, Waste Burial Holes Corrective Action Management Unit with Multiple-Layer Cap, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring

	Cost Component	Base Year	Year 1 (base year dollars)	Year 2 (base year dollars)	Future Costs (base year dollars)	Frequency	TOTAL (present value)
CAPITAL COSTS:							
Pre-Remediation	Biological Survey	$86,304	---	---	---	---	$86,304
	Elderberry Mitigation	$270,000	---	---	---	---	$270,000
	Decontamination Facilities [a]	$1,157,352	---	---	---	---	$1,157,352
	Building D&D (including disposal)	$511,850	---	---	---	---	$511,850
	Decommission Groundwater Wells [b]	$624,402	---	---	---	---	$624,402
	Clearing and Grubbing	$54,151	---	---	---	---	$54,151
	Demolish LFU-3 N-S Drainage Channel	$10,264	---	---	---	---	$10,264
Excavation and Backfill	ET Excavation [c]	$690,687	---	---	---	---	$690,687
	ET VOC "Hot Spot" Excavation	$252,758	---	---	---	---	$252,758
	LFU-1 Excavation [d]	$2,775,120	---	---	---	---	$2,775,120
	LFU-2 Excavation [e]	---	$2,619,614	---	---	---	$2,619,614
	LFU-2 VOC "Hot Spot" Excavation	---	$253,312	---	---	---	$253,312
	LFU-3 Excavation [f]	$893,073	---	---	---	---	$893,073
	ST and HFSDA Excavation	$206,155	---	---	---	---	$206,155
Materials Management and Disposal	Materials Management [g]	$7,259,526	---	---	---	---	$7,259,526
	Excavated Material Consolidation [h]	$9,549	---	---	---	---	$9,549
	Off-Site Transportation and Disposal	$77,135,180	---	---	---	---	$77,135,180
CAMU Construction	WBH Cap	---	$338,380	---	---	---	$338,380
Post-Remediation	Install New Groundwater Wells [b]	---	$297,551	---	---	---	$297,551
	LFU-1 Drainage Swale	$18,841	---	---	---	---	$18,841
	LFU-3 Drainage Channels	$91,540	---	---	---	---	$91,540
	Building Reconstruction [i]	---	$423,616	---	---	---	$423,616
	TOTAL CAPITAL COST						**$95,979,224**
O&M COSTS:	Institutional Controls	$328,407	$23,696	$23,696	$23,696	annual	$1,144,900
	Groundwater and Storm Water Monitoring [b]	$283,904	$161,496	$105,283	$105,283	annual	$4,383,323
	O&M Drainage System [j]	---	---	$1,000	$1,000	annual	$33,483
	O&M of Caps	---	---	$5,423	$13,015	annual	$428,598
	TOTAL O&M COST						**$5,990,304**
PERIODIC COSTS:	Five-Year Reviews	---	---	---	$26,542	every five years	$173,297
	TOTAL PERIODIC COST						**$173,297**
TOTAL PRESENT VALUE OF ALTERNATIVE [k]							**$102,142,825**

Notes:

Totaled values are rounded up to the nearest whole dollar.

[a] Decontamination Facilities include temporary facilities for decontamination of personnel and equipment; cost is proportional to the duration of the remedial action (one construction season or less in Alternatives SW-2 through SW-7 and two construction seasons in Alternatives SW-8, SW-9, and SW-10).

[b] Table 5-3 lists Site wells to be decommissioned, monitored, and constructed for each alternative.

Table F-8. Alternative SW-9 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

Notes (continued):

[c] The ET PTW and Exploratory Trenches will be excavated as part of the ET excavation.

[d] The LFU-1 PTW and Exploratory Trenches and the LFU-1 Drainage Area will be excavated as part of the LFU-1 excavation.

[e] The LFU-2 PTW and Exploratory Trenches will be excavated as part of the LFU-2 excavation.

[f] The LFU-3 PTW and Exploratory Trenches and LFU-3 Drainage Area will be excavated as part of the LFU-3 excavation.

[g] Materials Management includes the cost of stockpiling and management of excavated materials, waste characterization sampling, and sifting/sorting waste streams.

[h] Excavated Material Consolidation includes the cost of consolidating non-PTW excavated material from on-Site excavations within the footprint of the on-Site CAMU and beneath the final cap.

[i] Building Reconstruction cost includes the cost of constructing three warehouse type buildings at the Site, intended to replace the Geriatrics buildings (H-292 and H-293) and buildings H-253 and H-290.

[j] O&M Drainage System includes O&M costs for storm water drainage channels/swales.

[k] Discount factor for present value analysis is 2.7%; the period of analysis is 100 years.

Acronyms/Abbreviations:

CAMU - corrective action management unit
D&D - decommissioning and demolition
ET - Eastern Trenches
HFSDA - Hopland Field Station Disposal Area
LFU - landfill unit
N-S - north-south
O&M - operations and maintenance
PTW - principal threat waste
ST - Southern Trenches
VOC - volatile organic compound
WBH - Waste Burial Holes

Table F-9. Alternative SW-10 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

Excavate and Dispose of Waste Off-Site, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring

	Cost Component	Base Year	Year 1 (base year dollars)	Year 2 (base year dollars)	Future Costs (base year dollars)	Frequency	TOTAL (present value)
CAPITAL COSTS:							
Pre-Remediation	Biological Survey	$86,304	---	---	---	---	$86,304
	Elderberry Mitigation	$270,000	---	---	---	---	$270,000
	Decontamination Facilities [a]	$1,157,352	---	---	---	---	$1,157,352
	Building D&D (including disposal)	$511,850	---	---	---	---	$511,850
	Decommission Groundwater Wells [b]	$624,402	---	---	---	---	$624,402
	Clearing and Grubbing	$54,151	---	---	---	---	$54,151
	Demolish LFU-3 N-S Drainage Channel	$10,264	---	---	---	---	$10,264
Excavation and Backfill	ET Excavation [c]	$690,687	---	---	---	---	$690,687
	ET VOC "Hot Spot" Excavation	$252,758	---	---	---	---	$252,758
	LFU-1 Excavation [d]	$2,775,120	---	---	---	---	$2,775,120
	LFU-2 Excavation [e]	---	$2,619,614	---	---	---	$2,619,614
	LFU-2 VOC "Hot Spot" Excavation	---	$253,312	---	---	---	$253,312
	LFU-3 Excavation [f]	$893,073	---	---	---	---	$893,073
	ST and HFSDA Excavation	$206,155	---	---	---	---	$206,155
	WBH Excavation	---	$478,752	---	---	---	$478,752
Materials Management and Disposal	Materials Management [g]	$7,366,984	---	---	---	---	$7,366,984
	Off-Site Transportation and Disposal	$83,868,657	---	---	---	---	$83,868,657
Post-Remediation	Install New Groundwater Wells [a]	---	$297,551	---	---	---	$297,551
	LFU-1 Drainage Swale	$18,841	---	---	---	---	$18,841
	LFU-3 Drainage Channels	$91,540	---	---	---	---	$91,540
	Building Reconstruction [h]	---	$423,616	---	---	---	$423,616
	TOTAL CAPITAL COST						**$102,950,982**
O&M COSTS:	Institutional Controls	$328,407	$23,696	$23,696	$23,696	annual	$1,144,900
	Groundwater and Storm Water Monitoring [b]	$283,904	$161,496	$105,283	$105,283	annual	$4,383,323
	O&M Drainage System [i]	---	---	$1,000	$1,000	annual	$33,483
	TOTAL O&M COST						**$5,561,706**
PERIODIC COSTS:	Five-Year Reviews	---	---	---	$26,542	every five years	$173,297
	TOTAL PERIODIC COST						**$173,297**
TOTAL PRESENT VALUE OF ALTERNATIVE [j]							**$108,685,985**

Notes:

Totaled values are rounded up to the nearest whole dollar.

[a] Decontamination Facilities include temporary facilities for decontamination of personnel and equipment; cost is proportional to the duration of the remedial action (one construction season or less in Alternatives SW-2 through SW-7 and two construction seasons in Alternatives SW-8, SW-9, and SW-10).

Table F-9. Alternative SW-10 Cost Estimate Summary - Laboratory for Energy-related Health Research/Old Campus Landfill, University of California, Davis

Notes (continued):

[b] Table 5-3 lists Site wells to be decommissioned, monitored, and constructed for each alternative.

[c] The ET PTW and Exploratory Trenches will be excavated as part of the ET excavation.

[d] The LFU-1 PTW and Exploratory Trenches and the LFU-1 Drainage Area will be excavated as part of the LFU-1 excavation.

[e] The LFU-2 PTW and Exploratory Trenches will be excavated as part of the LFU-2 excavation.

[f] The LFU-3 PTW and Exploratory Trenches and LFU-3 Drainage Area will be excavated as part of the LFU-3 excavation.

[g] Materials Management includes the cost of stockpiling and management of excavated materials, waste characterization sampling, and sifting/sorting waste streams.

[h] Building Reconstruction cost includes the cost of constructing three warehouse type buildings at the Site, intended to replace the Geriatrics buildings (H-292 and H-293) and buildings H-253 and H-290.

[i] O&M Drainage System includes O&M costs for storm water drainage channels/swales.

[j] Discount factor for present value analysis is 2.7%; the period of analysis is 100 years.

Acronyms/Abbreviations:

D&D - decommissioning and demolition
ET - Eastern Trenches
HFSDA - Hopland Field Station Disposal Area
LFU - landfill unit
N-S - north-south
O&M - operations and maintenance
PTW - principal threat waste
ST - Southern Trenches
VOC - volatile organic compound
WBH - Waste Burial Holes

ATTACHMENT F-1a

MARKUP TEMPLATE PREFERENCES REPORT

Attachment F-1a. Markup Template Preferences Report

System:

RACER Version: 10.3.0

System Defaults	Markup Percentage
Professional Labor Overhead/G&A	132.0
Field Office Overhead/G&A	25.0
Subcontractor Profit	8.0
Prime Profit	8.0
Contingency	0.0
Owner Cost	11.0

Non-Radiological Work_No Owner Costs	Markup Percentage
Professional Labor Overhead/G&A	132.0
Field Office Overhead/G&A	25.0
Subcontractor Profit	8.0
Prime Profit	8.0
Contingency	0.0
Owner Cost	0.0

Contingency Markup 10%_with Owner Cost	Markup Percentage
Professional Labor Overhead/G&A	132.0
Field Office Overhead/G&A	25.0
Subcontractor Profit	8.0
Prime Profit	8.0
Contingency	10.0
Owner Cost	11.0

Contingency 15% Markup Template_with Owner Costs	Markup Percentage
Professional Labor Overhead/G&A	132.0
Field Office Overhead/G&A	25.0
Subcontractor Profit	8.0
Prime Profit	8.0
Contingency	15.0
Owner Cost	11.0

Acronyms/Abbreviations:

G&A – general and administrative
RACER - Remedial Action Cost Engineering and Requirements

ATTACHMENT F-1b

MARKUP DEFINITIONS

ATTACHMENT F-1B. MARKUP DEFINITIONS

The following descriptions of markup categories are adapted from the Remedial Action Cost Engineering and Requirements (RACER) help menu and explain what types of costs each markup category includes.

Professional Labor Overhead/General and Administrative

Professional Labor Overhead/General and Administrative (G&A) costs in RACER include the non project-specific costs that are required to support labor and general operations of the professional oversight contractors' business. These costs cannot be specifically attributed to any given job or project and, therefore, must be apportioned across all of the contractors' projects. Professional Labor Overhead/G&A costs may include the following categories or items:

- Management and office staff salary and expense;
- Marketing and bid and proposal development;
- Accounting;
- Personnel;
- General communications and travel;
- Rent;
- Maintenance;
- Utilities;
- Supplies;
- Depreciation;
- Property taxes; and
- G&A, including corporate management, corporate accounting, purchasing, legal, general business insurance, corporate vehicles, etc.

Research indicates that professional labor overhead and G&A typically ranges from 90% to 175%. The default value for this markup factor is 132%, which is applied only to professional labor line items, or assemblies, in the RACER database.

Field Office Overhead/G&A

Field Office Overhead/G&A costs in RACER include all indirect costs to the general contractor(s) performing the construction work, including job overhead costs associated with field-related tasks that are required to execute a contract, as well as non project-specific costs that are required to support labor and general operations of the general contractors' business. Field Office Overhead/G&A costs may include the items listed above, as well as the following job-related overhead items:

- Taxes;
- Project-specific insurance;
- Bonds;
- Permits and licenses;
- Preparation and submittal of change order requests;
- Soliciting bids and selecting subcontractors;
- Subcontract administration;
- General supervision of contractor's work force;
- Temporary office personnel for field office operations;
- Prepare, monitor, and update schedules;
- Preconstruction conference at job site;
- Preparatory work and testing services;
- Temporary project facilities;
- Temporary utilities (e.g., phone and electrical);
- Operations and maintenance of temporary project-site facilities;
- Project vehicles;
- Personal protective equipment and Occupational Safety and Health Administration requirements;
- Field sampling and construction quality control (CQC) testing;
- Mobilization and demobilization (materials, labor, and equipment); and
- Site security; and
- Final site cleanup and restoration.

Research indicates that field office overhead and G&A typically ranges from 8% to 60%. The default value for this markup factor is 25%, which is applied to all assemblies except the professional labor cost assemblies of the RACER database and assemblies on the No Markups list.

Prime contractor profit

Profit is a positive return made on an investment after accounting for incurred costs. The profit margin for a given project may depend on a number of factors, including:

- Degree of risk;
- Relative difficulty of work;
- Size of the job;
- Period of performance;
- Contractor's investment;

- Assistance by the government; and
- Subcontracting.

Research indicates that prime contractor profit typically ranges from 3.5% to 15%. The default value for this markup factor is 8%, which is applied to all assemblies except those on the No Markups list.

Subcontractor profit

Profit is a positive return made on an investment after accounting for incurred costs. The profit margin for a given project may depend on a number of factors, including:

- Degree of risk;
- Relative difficulty of work;
- Size of the job;
- Period of performance;
- Contractor's investment; and
- Assistance by the government.

Research indicates that subcontractor profit typically ranges from 3.5% to 15%. The default value for this markup factor is 8%, which is applied to portions of the technology assigned to the subcontractors.

Contingency

In RACER, contingency is an amount added to an estimate to allow for unknown or unforeseen items, conditions, or events that will likely result in additional costs. Contingency allowances are estimated based on the defined project scope at the time of the estimate. Factors that may affect the contingency percentage used include:

- Type of contract (e.g., fixed price vs. "cost-plus");
- Project complexity and technological uncertainty;
- Engineering design detail;
- Available project site information;
- Type, nature, and extent of contamination; and
- Approach.

Owner Cost

In RACER, Owner Cost is the owner's workforce cost to initiate, contract, oversee, direct, implement, and close out the project. Owner costs may include the following categories or items:

- Supervision, inspection, and overhead;
- Construction management and "Owner's Representative" services;

- Laboratory quality assurance;
- Operations and maintenance manual; and
- Other costs (e.g., technical, real estate, administrative, contracting, accounting, etc.).

The system default percentage for Owner Cost is 11 percent.

Professional Labor Management

The professional labor management cost sub-component, or "Technology" in RACER, focuses on professional labor costs incurred by remedial action contractors during construction or performance of a remedial action. Professional labor management includes activities that are not accounted for within the Professional Labor Overhead/G&A, Field Overhead/G&A, Overhead, or Owner's Cost factors of the phase markup template. The activities encompassed by this technology are for costs generally incurred during the removal/interim action and remedial action phases of the environmental remediation process. As such, this technology is included as a sub-component of a larger cost component.

Professional labor management includes the costs of typical professional support activities associated with construction, including preparation of site-specific construction activities, incidental permit acquisition, and contract-required deliverables. It also includes typical site-specific professional support activities associated with remedial action, including evaluation of sampling and analysis data, comparison of results with project goals, coordination of field activities, and documentation and reporting of field activities. Where professional labor management is not specifically included as a cost sub-component, it is assumed that such cost estimates contain professional labor hours bundled with the cost of implementation for that cost component.

The Professional Labor Management technology is designed to capture the costs of the following activities performed by a contractor:

- Prepare and submit contract-required deliverables;
- Project-specific planning documents (work plan, health and safety plan, quality assurance project plan, materials handling plan, traffic control plan, etc.);
- Shop drawings and technical data;
- Analytical data for field samples CQC test results;
- Health and safety monitoring and reporting;
- Perimeter air quality monitoring and reporting;
- Preparation and submittal of as-built drawings;
- Preparation of waste characterization forms for treatment/disposal facility acceptance; and
- Preparation, tracking and reporting of manifests for treatment/disposal of site wastes.

Acronyms/Abbreviations:

CQC	construction quality control
G&A	general and administrative
RACER	Remedial Action Cost Engineering and Requirements

ATTACHMENT F-2a

ALTERNATIVE SW-2 COST ASSUMPTIONS

ALTERNATIVE SW-2 COST ASSUMPTIONS

Attachment F-2a-1. Alternative SW-2 Description

Attachment F-2a-2. Planning and Oversight

Attachment F-2a-3. Data Gap Investigation of the Southern Trenches and Hopland Field Station Disposal Area

Attachment F-2a-4. Decontamination Facilities

Attachment F-2a-5. Off-Site Transportation and Disposal

Attachment F-2a-6. Install New Groundwater Monitoring Wells

Attachment F-2a-7. O&M: Institutional Controls

Attachment F-2a-8. O&M: Groundwater and Storm Water Monitoring

Attachment F-2a-9. Periodic Costs: Five Year Reviews

Attachment F-2a-1. Alternative SW-2 Description - Cost Estimates, UC Davis LEHR/OCL

Alternative SW-2. Institutional Controls and Groundwater Monitoring - See Section 5 of the FS - Volume 1 for a description of this alternative.

Alternative SW-2 Components Listed:

Planning and oversight
Data gap investigations at the ST and the HFSDA
Decontamination Facilities
Off-Site Transportation and Disposal
Install New Groundwater Monitoring Wells
Operations and Maintenance (O&M): Institutional Controls
O&M: Groundwater and Storm Water Monitoring
Periodic Costs: Five Year Reviews

Planning and Oversight

Work planning, Health and Safety, Construction Quality Assurance/Quality Control Program, Construction Site Environmental Controls, Materials Management Plan (Table 5-1)

Costs for most planning and oversight are included in RACER's "Professional Labor Management" cost sub-component and in professional labor cost assemblies.
These planning and oversight activities include:

Preparation and submittal of Contract-Required Deliverables
Preparation and submittal of project-specific planning documents (Work Plan, HASP, QAPP, materials management plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Sampling and Construction Quality Control Test Results
Health & Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Costs are estimated as a percentage of the calculated marked-up cost for a given remedial action component through "Professional Labor Management," or through professional labor assemblies included in the estimate for the remedial action cost component.

"Professional Labor Management" includes the costs of typical professional support activities associated with construction including preparation of site-specific construction activities, incidental permit acquisition, and contract-required deliverables. It also includes typical site-specific professional support activities associated with remedial action including evaluation of sampling and analysis data, comparison of results with project goals, coordination of field activities, and documentation and reporting of field activities. Each cost component has planning and oversight costs associated with it; where professional labor management is not specifically included as a cost sub-component, it is assumed that such cost estimates contain professional labor hours bundled with the cost for implementation of that cost component.

Attachment F-2a-3. Data Gap Investigation of the Southern Trenches and Hopland Field Station Disposal Area - Cost Estimates, UC Davis LEHR/OCL

Description:

Pre-remedial action characterization study to be conducted in the ST and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two sample per ten-foot length of the trench plus two end-sidewall samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Assumptions:

Southern Trenches

Total Number of Exploratory Trenches	5	
Depth	6	ft
Number of Samples	80	
Analytes:	Ra-226, Ra-228, Sr-90, Cs-137, isotopic uranium, tritium, and C-14	

Hopland Field Station Disposal Area (HFSDA)

Total Number of Exploratory Trenches	3	
Depth	6	ft
Number of Samples	21	
Analytes:	Ra-226, Ra-228, Sr-90, Cs-137, isotopic uranium, tritium, and C-14	

Survey Exploratory Trenches

Three man crew to survey investigation trenches and groundwater sampling locations (x17). Registered surveyor report. Assume surveying completed in one day after completion of investigation.

Attachment F-2a-4. Decontamination Facilities - Cost Estimates, UC Davis LEHR/OCL

Decontamination facilities for equipment and personnel during duration of remedial activities. Include washout for decontamination of trucks leaving Site. Assume average crew size during remedial action is five workers. Assume Site investigation lasts up to four weeks.

Equipment Decontamination Operation Length	4	weeks
Average crew size	5	
Shifts	1	per day
Safety Level	Level D	

Attachment F-2a-5. Off-Site Transportation and Disposal - Cost Estimates, UC Davis LEHR/OCL

	LLRW (LCY)	**Mixed Waste** (LCY)	**RCRA Hazardous** (LCY)	**Non-RCRA Hazardous** (LCY)	**Non-Hazardous** (LCY)	**Building Hazardous** (LCY)	**Building Non-Hazardous** (LCY)	**Drums/Lab Pack** (number of drums)
Distance to disposal facility	594 miles	594 miles	227 miles	227 miles	93 miles	227 miles	93 miles	594 miles
Volume*	0	0	3	0	0	0	0	
Volume for Incineration**	0	0	0	0	0	0	0	
Final Disposal Volumes	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**1**

* See Table E-13 (Appendix E, FS - Volume 1).
** Biological waste only.

Attachment F-2a-6. Install New Groundwater Monitoring Wells - Cost Estimates, UC Davis LEHR/OCL

Groundwater Monitoring Well Installation - Nine HSU-1 groundwater monitoring wells would be installed. The wells will have screen/sand pack intervals of seven feet or less to minimize their potential to act as vertical conduits for downward COC migration, and will be completed just below the bottom of the depth range of seasonal water table fluctuation.

9 wells, 70 ft depth, 2" diameter, PVC Schedule 80
Dispose drill cuttings as non-hazardous waste
Survey and develop completed wells

Attachment F-2a-7. O&M: Institutional Controls - Cost Estimates, UC Davis LEHR/OCL

Complete an initial survey of the Site to establish legal boundaries.
Implement and maintain land use controls.
Document landfill locations and prohibit Site development or activities incompatible with designated land use.

		# meetings	# people	# days	airfare	mileage to meeting site
Planning Documents	LUC Assurance Plan	2	2	1	0	70
	LUC Implementation Plan	2	2	1	0	70
	Construction Permitting	1	1	1	0	70
	Geographic Information Systems/Overlay Maps	1	1	1	0	70
Implementation	Deed Notification	1	unit			
	Restrictive Covenants	1	unit			
	Access Control Signs	22	unit	Assume one sign every 150 feet around perimeter of land disposal units		
	Utility Notification Service	1	unit			
	GIS/Overlay maps	1	unit			
Monitoring and Enforcement						
	Duration of monitoring/enforcement	100	YRS (or lifetime of alternative)			
	Reports & Certifications	1	per year			
	Site Visits/Inspections	1	per year			
Survey:	5 days, licensed surveyors' report					

Attachment F-2a-8. O&M: Groundwater and Storm Water Monitoring - Cost Estimates, UC Davis LEHR/OCL

Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the land disposal units according to Table 5-3. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, semivolatile organic compounds (1,4-dioxane by single ion monitoring) CAM 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three designated storm water sampling locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. The groundwater and storm water monitoring period will continue throughout the lifetime of the alternative until Site cleanup goals are achieved.

Includes data validation, electronic data import, data management, and monitoring reports.
19 wells to be included.

Attachment F-2a-9. Periodic Costs: Five Year Reviews - Cost Estimates, UC Davis LEHR/OCL

Review and update all documents associated with compliance, performance, institutional/land use controls, and monitoring results. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews for lifetime of the alternative.

Document Review	
Interviews	Current and Previous Staff Management
	Community Groups
	State Contacts
	Local Government Contacts
	Operations & Maintenance Contractors
	PRPs
	Remedial Design Consultant
Site Inspection	General Site Inspection
	Containment System Inspection
	Monitoring Systems Inspection
	Treatment Systems Inspection
	Regulatory Compliance
	Site Visit Documentation (Photos, Diagrams, etc.)
Report	

ATTACHMENT F-2b

ALTERNATIVE SW-2 ESTIMATE DOCUMENTATION REPORT

Estimate Documentation Report

System:

RACER Version: 10.3.0
Database Location: C:\Documents and Settings\gch\Application Data\AECOM\RACER 10.3\Racer.mdb

Folder:

Folder Name: Alternative SW-2

Project:

Project ID: FS_Cost
Project Name: Feasibility Study Cost Estimate
Project Category: Detailed Analysis of FS Alternatives

Location
State / Country: CALIFORNIA
City: SACRAMENTO

Location Modifier	Default	User
	1.203	1.203

Options
Database: Modified System
Cost Database Date: 2010
Report Option: Calendar

Description
Cost estimates in support of the CERCLA Feasibility Study for University of California, Davis areas of responsibility at the Laboratory for Energy-Related Health Research/Old Campus Landfill Superfund Site. Use Modified System Cost to allow for custom cost assemblies

Estimate Documentation Report

Site Documentation:

Site ID: LEHR/OCL
Site Name: Alternative SW-2
Site Type: Land Disposal Units

Media/Waste Type
Primary: Soil
Secondary: N/A

Contaminant
Primary: Multi-Contaminant
Secondary: Radioactive (Low Level)

Phase Names
Pre-Study:
Study:
Design:
Removal/Interim Action:
Remedial Action:
Operations & Maintenance:
Long Term Monitoring:
Site Closeout:

Documentation
Description: Alternative SW-2 - Institutional Controls and Groundwater Monitoring

See Section 5 of the FS for a description of this alternative.
Support Team: Weiss Staff
References: RACER 2010 System Costs Database

Estimate Documentation Report

Estimated Costs:

Phase Names		Direct Cost	Marked-up Cost
Data Gap Investigation		$84,226	$157,394
Decontamination Facilities		$18,913	$37,879
Institutional Controls		$445,672	$1,039,283
Install New GW Monitoring Wells		$76,222	$115,168
Off-Site Transportation and Disposal		$6,940	$8,339
Five-Year Reviews		$63,558	$159,250
Groundwater and Storm Water Monitoring		$3,120,305	$4,198,648
	Total Cost:	$3,815,835	$5,715,961

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Data Gap Investigation
Description: Pre-remedial action characterization study to be conducted in the Southern Trenches and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two samples per ten-foot length of the trench plus two end-sidewall samples and additional QA/QC samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY	Yes	5	95
Site Inspection	Yes	100	0

Total Marked-up Cost: $157,394

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey investigation trenches. Registered surveyor report. Assume surveying completed in one day after completion of all trenches.

Estimate Documentation Report

Technology Name: **Site Inspection (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Planning		Yes	n/a
Site Investigation		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		Yes	n/a
Site Distance		70	MI
Site Complexity		Moderate	n/a
Planning			
Required Parameters			
Data Review		Yes	n/a
SI Work Plan		Yes	n/a
SI Supplemental Plans (Health and Safety,		Yes	n/a
Site Investigation			
Required Parameters			
Provide Fieldwork Support		Yes	n/a
Data Validation		Yes	n/a
Compose SI Report		Yes	n/a
Complete Revised HRS Scoring Package		Yes	n/a
Implement Community Relations		Yes	n/a
S&A			
Required Parameters			
Bioassays		No	n/a
Crew Size		2 Field Technicians	n/a
Include QA/QC Samples		Yes	n/a
Groundwater		No	n/a
Surface Water		No	n/a
Sampling - Water: Primary Analytical Template		None	n/a
Sampling - Water: Secondary Analytical Template		None	n/a
Surface Soil		No	n/a
Subsurface Soil		Yes	n/a
Sediment		No	n/a
Sampling - Soil/Sediment: Primary Analytical Template		System Soil - Low Level Radioactive	n/a

Estimate Documentation Report

Technology Name: **Site Inspection (# 1)**

Description	*Default*	*Value*	*UOM*
S&A			
Required Parameters			
Sampling - Soil/Sediment: Secondary Analytical Template		None	n/a
Air		No	n/a
Soil Gas		No	n/a
Sampling - Air/Soil Gas: Primary Analytical Template		None	n/a
Sampling - Air/Soil Gas: Secondary Analytical Template		None	n/a
Media			
Required Parameters			
Subsurface Soil: Avg. Sample Depth		12	FT
Subsurface Soil: # Sampling Locations		8	EA
Subsurface Soil: # Samples per Location		13	EA
Subsurface Soil: # Rounds		1	EA
Methodology			
Required Parameters			
Methodology: Subsurface Soil	Power Auger	Air Rotary Rig	n/a
Methodology: Turnaround Time		Standard (21 Days)	n/a
Methodology: Quality Control		Level 4	n/a

Comments: Pre-remedial action characterization study to be conducted in the Southern Trenches and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two sample per ten-foot length of the trench plus two end-sidewall samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decontamination Facilities
Description: Provide decontamination facilities for equipment and personnel throughout duration of the remedial action.

Approach: Ex Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Decontamination Facilities	Yes	100	0

Total Marked-up Cost: $37,879

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		36,075	$
Percentage	20.1	5	%
Dollar Amount		1,804	$

Comments:

Estimate Documentation Report

Technology Name: **Decontamination Facilities (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
New Decontamination Facility Pad Construction		No	n/a
Equipment Rating		n/a	n/a
Equipment Decontamination Operations		Yes	n/a
Equipment Decontamination Operations: Duration		4	weeks
Personnel Decontamination Trailers		Yes	n/a
Personnel Decontamination Trailers: Average Crew Size		5	per shift
Personnel Decontamination Trailers: Duration		4	weeks
Safety Level		D	n/a
Work Shifts			
Secondary Parameters			
Equipment Decontamination	One Shift per Day		n/a
Personnel Decontamination	One Shift per Day		n/a

Comments: Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 36 weeks.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Institutional Controls
Description: Implement and maintain Institutional/Land Use Controls to prohibit site development or activities incompatible with designated land use.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
INITIAL LAND SURVEY	Yes	5	95
ADMINISTRATIVE LAND USE CONTROLS	Yes	100	0

Total Marked-up Cost: $1,039,283

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **INITIAL LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		INITIAL LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew to establish legal boundaries defining the Site's boundaries. Licensed surveyor report. 3 man survey crew - 5 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Rename Model		ADMINISTRATIVE LAND USE CONTROLS	n/a
Planning Documents		Yes	n/a
Planning Documents: Start Date		2010	n/a
Implementation		Yes	n/a
Implementation: Start Date		2010	n/a
Monitoring & Enforcement		Yes	n/a
Monitoring & Enforcement: Start Date		2010	n/a
Modification/Termination		No	n/a
Type of Site		Former Government Site	n/a
Planning Documents			
Required Parameters			
LUC Assurance Plan (LUCAP)		Yes	n/a
LUC Assurance Plan (LUCAP): Plan Complexity		Medium	n/a
LUC Implementation Plan (LUCIP)		Yes	n/a
LUC Implementation Plan (LUCIP): Number		1	EA
LUC Implementation Plan (LUCIP): Plan Complexity		Medium	n/a
Long-term Stewardship (LTS) Plan		No	n/a
Memorandum of Agreements (MOA)		No	n/a
Installation (or City) Master Plan		No	n/a
Construction Permitting		Yes	n/a
Construction Permitting: Number		1	EA
Construction Permitting: Plan Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Plan Complexity		Low	n/a
Planning Meetings			
Required Parameters			
LUCAP: Number of Meetings		2	EA
LUCAP: Number of People		2	EA

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Planning Meetings			
Required Parameters			
LUCAP: Number of Days		1	EA
LUCAP: Airfare Cost		0	$
LUCAP: Mileage to Meeting Site		70	MI
LUCIP: Number of Meetings		2	EA
LUCIP: Number of People		2	EA
LUCIP: Number of Days		1	EA
LUCIP: Airfare Cost		0	$
LUCIP: Mileage to Meeting Site		70	MI
Construction Permitting: Number of Meetings		1	EA
Construction Permitting: Number of People		1	EA
Construction Permitting: Number of Days		1	EA
Construction Permitting: Airfare Cost		0	$
Construction Permitting: Mileage to Meeting Site		70	MI
GIS/Overlay Maps: Number of Meetings		1	EA
GIS/Overlay Maps: Number of People		1	EA
GIS/Overlay Maps: Number of Days		1	EA
GIS/Overlay Maps: Airfare Cost		0	$
GIS/Overlay Maps: Mileage to Meeting Site		70	MI
Implementation			
Required Parameters			
Modify Installation (or City) Master Plan		No	n/a
Deed Notification		Yes	n/a
Deed Notification: Number		1	EA
Deed Notification: Task Complexity		Low	n/a
Negotiating Easements		No	n/a
Restrictive Covenants		Yes	n/a
Restrictive Covenants: Number		1	EA
Restrictive Covenants: Task Complexity		Low	n/a
Equitable Servitudes		No	n/a
Access Control Signs		Yes	n/a

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Implementation			
Required Parameters			
Access Control Signs: Number		22	EA
Access Control Signs: Task Complexity		Low	n/a
Utility Notification Service		Yes	n/a
Access Control Signs: Number		1	EA
Access Control Signs: Task Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Task Complexity		Low	n/a
Develop Finding of Suitability to Transfer (FOST)		No	n/a
Monitoring & Enforcement			
Required Parameters			
Duration of Monitoring/Enforcement		31	Years
Notice Letters		No	n/a
Guard Service/Security		No	n/a
Reports & Certifications		Yes	n/a
Reports & Certifications: Frequency		Annually	n/a
Site Visits/Inspections		Yes	n/a
Site Visits/Inspections: Number		1	EA
Site Visits/Inspections: Safety Level		D	n/a
Site Visits/Inspections: Duration		1	Days
Site Visits/Inspections: Number of People		2	EA
Site Visits/Inspections: Frequency		Annually	n/a
Site Visits/Inspections: Airfare		0	$ Per Ticket
Site Visits/Inspections: Mileage		70	MI

Comments: Implement and maintain land use controls.
Document landfill units and prohibit site development or activities that are incompatible with designated land use.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Install New GW Monitoring Wells
Description: Install, develop, and survey new groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Groundwater Monitoring Well	Yes	40	60
Residual Waste Management	Yes	80	20
LAND SURVEY	Yes	5	95
Professional Labor Management	Yes	80	20
WELL DEVELOPMENT	Yes	40	60

Total Marked-up Cost: $115,168

Technologies:

Estimate Documentation Report

Technology Name: **Groundwater Monitoring Well (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Aquifers		One	n/a
Include Guard Posts		No	n/a
Depth to Groundwater to Aquifer One		50	FT
Number of Wells to Aquifer One		9	EA
Safety Level		D	n/a
Aquifer One			
Required Parameters			
Aquifer One: Average Well Depth		70	LF
Aquifer One: Formation Type		Unconsolidated	n/a
Aquifer One: Drilling Method		Hollow Stem	n/a
Aquifer One: Well Diameter		2 Inch	n/a
Aquifer One: Well Construction Material		PVC Schedule 80	n/a
Aquifer One: Split Spoon Sample Collection		Yes	n/a
Aquifer One: Average Number of Soil Samples per Well		0	EA
Aquifer One: Soil Analytical Template		None	n/a
Aquifer One: Safety Level		D	n/a

Comments: Install new wells according to Table 5-3.

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		9	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey newly installed groundwater monitoring wells. Registered surveyor report. 0.5 day

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		101,560	$
Percentage	19.9	5	%
Dollar Amount		5,078	$

Comments:

Technology Name: **User Defined Estimate (# 2)**
User Name: **WELL DEVELOPMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WELL DEVELOPMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.01	n/a
Safety Level		D	n/a

Comments: Rent equipment for well develoment for 1 week. One equipment operator and one supervising engineer/geologist.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Off-Site Transportation and Disposal
Description: Transport and dispose of RCRA hazardous, mixed waste, Non-RCRA hazardous, LLRW, and non-hazardous waste material generated by Site remedial excavations. Hazardous wastes will be transported to Class I hazardous waste facility; solid LLRW and mixed waste to LLRW accepting facility; and non-hazardous materials at Class II non-hazardous landfill. Assume drummed PTW will be sent to the LLRW accepting facility, and biological waste will be incinerated.

Approach: Ex Situ
Start Date: September, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0

Total Marked-up Cost: $8,339

Technologies:

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Non-leaking Drums	n/a
Quantity of Non-Leaking Drums		1	Drums
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dipose of drums containing PTW requiring stabilization. Assume default acceptance and treatment fee. Assume 594 mile transport distance.

Technology Name: **Off-site Transportation and Waste Disposal (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		2	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose RCRA hazardous waste. Assume $170/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Five-Year Reviews
Description: Five-Year Reviews for all technologies and controls implemented.

Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Five-Year Review	Yes	100	0

Total Marked-up Cost: $159,250

Technologies:

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Site Complexity		Low	n/a
Document Review		Yes	n/a
Interviews		Yes	n/a
Site Inspection		Yes	n/a
Report		Yes	n/a
Travel		No	n/a
Rebound Study		No	n/a
Start Date		March-2015	n/a
No. Reviews		6	EA
Document Review			
Required Parameters			
5-Year Review Check List		Yes	n/a
Record of Decision		Yes	n/a
Remedial Action Design & Construction		Yes	n/a
Close-Out Report		Yes	n/a
Operations & Maintenance Manuals & Reports		Yes	n/a
Consent Decree or Settlement Records		Yes	n/a
Groundwater Monitoring & Reports		Yes	n/a
Remedial Action Required		Yes	n/a
Previous 5-Year Review Reports		Yes	n/a
Interviews			
Required Parameters			
Current and Previous Staff Management		Yes	n/a
Community Groups		Yes	n/a
State Contacts		Yes	n/a
Local Government Contacts		Yes	n/a
Operations & Maintenance Contractors		Yes	n/a
PRPs		Yes	n/a
Remedial Design Consultant		Yes	n/a
Site Inspection			
Required Parameters			

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
Site Inspection			
Required Parameters			
General Site Inspection		Yes	n/a
Containment System Inspection		Yes	n/a
Monitoring Systems Inspection		Yes	n/a
Treatment Systems Inspection		Yes	n/a
Regulatory Compliance		Yes	n/a
Site Visit Documentation (Photos, Diagrams, etc.)		Yes	n/a
Report			
Required Parameters			
Introduction		Yes	n/a
Remedial Objectives		Yes	n/a
ARARs Review		Yes	n/a
Summary of Site Visit		Yes	n/a
Areas of Non Compliance		Yes	n/a
Technology Recommendations		Yes	n/a
Statement of Protectiveness		Yes	n/a
Next Review		Yes	n/a
Implementation Requirements		Yes	n/a

Comments: Inspect landfill areas for performance issues such as erosion or excessive settlement. Review and update all documents associated with compliance, performance, land use controls, and monitoring results. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews every five years for the lifetime of the alternative.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Groundwater and Storm Water Monitoring
Description: Groundwater monitoring at Site wells and storm water monitoring for lifetime of alternative until cleanup objectives are met. Sample collection, analysis, data validation, data import and monitoring reports.

Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
MONITORING	Yes	100	0

Total Marked-up Cost: $4,198,648

Technologies:

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		MONITORING	n/a
Groundwater		Yes	n/a
Surface Soil		No	n/a
Surface Water		Yes	n/a
Subsurface Soil		No	n/a
Sediment		No	n/a
Soil Gas		No	n/a
Air		No	n/a
Site Distance (One-way)		70	MI
Safety Level		D	n/a
Groundwater			
Required Parameters			
Average Sample Depth		50	FT
Samples per Event (First Year)		19	n/a
Samples per Event (Out Years)		19	n/a
Number of Events (First Year)		4	n/a
Number of Events (Out Years)		1	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	System Water - Low Level Radioactive	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Sampling Method	Existing Wells - Low Flow Pump	Existing Wells - Low Flow Pump	n/a
Number of Wells/Day	8	8	EA
Contain Purge Water	Yes	Yes	n/a
Surface Water			
Required Parameters			
Average Sample Depth		0	FT

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
Surface Water			
Required Parameters			
Samples per Event (First Year)		3	n/a
Samples per Event (Out Years)		3	n/a
Number of Events (First Year)		2	n/a
Number of Events (Out Years)		2	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	None	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Number of Samples/Day	8	8	EA
QA/QC			
Secondary Parameters			
Split Samples	1: 10	1: 10	EA
Field Duplicate Samples	1: 10	1: 10	EA
Rinse Blanks (per Round)	1	1	EA
Trip Blanks (per Day)	1	1	EA
Matrix Spikes/Matrix Spike Duplicates	1: 20	1: 20	EA
Data Management			
Secondary Parameters			
Monitoring Plan	Standard	Standard	n/a
Lab Data Review	Stage 2b	Stage 2b	n/a
Submit Data Electronically	Yes	Yes	n/a
Monitoring Reports	Standard	Abbreviated	n/a

Comments: Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the land disposal units according to Table 5-3. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, Semivolatile organic compounds (1,4-dioxane by single ion monitoring) Cam 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. The total groundwater and stormwater monitoring period will continue until remedial action objectives are achieved.

continue until remedial action objectives are achieved.
Includes data validation, electronic data import, data management and monitoring reports.

ATTACHMENT F-2c

ALTERNATIVE SW-2 ASSEMBLY LEVEL REPORT

See file in Appendix F Folder titled 'Attachment_F-2c_SW-2_AssemblyLevelReport.xlsx'

ATTACHMENT F-3a

ALTERNATIVE SW-3 COST ASSUMPTIONS

ALTERNATIVE SW-3 COST ASSUMPTIONS

Attachment F-3a-1. Alternative SW-3 Description

Attachment F-3a-2. Planning and Oversight

Attachment F-3a-3. Biological Survey and Elderberry Shrub Cluster Relocation

Attachment F-3a-4. Data Gaps Investigation of the Southern Trenches and Hopland Field Station Disposal Area

Attachment F-3a-5. Decontamination Facilities

Attachment F-3a-6. Building Decommissioning and Demolition, Building Sampling and Analysis

Attachment F-3a-7. Building Decommissioning and Demolition, Building Demolition and Reconstruction

Attachment F-3a-8. Clearing and Grubbing

Attachment F-3a-9. Excavation of ET Known PTW and Exploratory Trenches

Attachment F-3a-10. Excavation of LFU-1 Known PTW and Exploratory Trenches

Attachment F-3a-11. Excavation of LFU-2 Known PTW and Exploratory Trenches

Attachment F-3a-12. Excavation of LFU-3 Exploratory Trenches

Attachment F-3a-13. Excavation of ET VOC “Hot Spot”

Attachment F-3a-14. Excavation of LFU-2 VOC “Hot Spot”

Attachment F-3a-15. Materials Management

Attachment F-3a-16. Off-Site Transportation and Disposal

Attachment F-3a-17. Grade and Revegetate LFU-1

Attachment F-3a-18. Grade and Revegetate LFU-2/ET/WBH

Attachment F-3a-19. Grade and Revegetate LFU-3

Attachment F-3a-20. Install New Groundwater Monitoring Wells

Attachment F-3a-21. Storm Drainage Controls

Attachment F-3a-22. O&M: Institutional Controls

Attachment F-3a-23. O&M: Groundwater and Storm Water Monitoring

Attachment F-3a-24. O&M of Storm Water Drainage Infrastructure

Attachment F-3a-25. O&M of Graded Areas

Attachment F-3a-26. Periodic Costs: Five-Year Reviews

Attachment F-3a-27. Contingent Action: Grade and Revegetate ST and HSFDA

Attachment F-3a-1. Alternative SW-3 Description - Cost Estimates, UC Davis LEHR/OCL

Alternative SW-3. VOC "Hot Spot" Removal, Three On-Site Corrective Action Management Units with Graded Covers, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring

— See Section 5 of the FS - Volume 1 for a description of this alternative.

Alternative SW-3 Components Listed:

- Planning and oversight
- Biological Survey
- Elderberry Shrub Cluster Relocation
- Data Gap Investigation
- Decontamination Facilities
- Building Decommissioning and Demolition
  - Building Sampling
  - Building Demolition and Reconstruction
- Clearing and Grubbing
- Excavation of ET Known PTW and Exploratory Trenches
- Excavation of LFU-1 Known PTW and Exploratory Trenches
- Excavation of LFU-2 Known PTW and Exploratory Trenches
- Excavation of LFU-3 Known PTW and Exploratory Trenches
- ET VOC "Hot Spot," East and West Excavation
- LFU-2 VOC "Hot Spot" Excavation
- Materials Management
- Off-Site Transportation and Disposal
- Grade and Revegetate LFU-1
- Grade and Revegetate LFU-2/ET/WBH
- Grade and Revegetate LFU-3
- Install New Groundwater Wells
- Storm Drainage Controls
  - Storm Water Collection and Conveyance System
  - Installation of extended detention basins
  - Installation of drainage channel along eastern edge of LFU-1
  - Redirect drainage ditch south along perimeter of LFU-3
  - Repair/re-seal LFU-3 north-south drainage channel
- Operations and Maintenance (O&M): Institutional Controls
- O&M: Groundwater and Storm Water Monitoring
- O&M of Storm Water Drainage Infrastructure
- O&M of Graded Areas
- Periodic Costs: Storm Water Lift Station Repair (See O&M of Storm Water Drainage Infrastructure)
- Periodic Costs: Five Year Reviews
- Contingent Action: Grade and Revegetate ST and HFSDA

Planning and Oversight

Work planning, Health and Safety, Construction Quality Assurance/Quality Control Program, Construction Site Environmental Controls, Materials Management Plan (Table 5-1)

Costs for most planning and oversight are included in RACER's "Professional Labor Management" cost sub-component and in professional labor cost assemblies.
These planning and oversight activities include:

Preparation and submittal of Contract-Required Deliverables
Preparation and submittal of project-specific planning documents (Work Plan, HASP, QAPP, materials management plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Sampling and Construction Quality Control Test Results
Health & Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Costs are estimated as a percentage of the calculated marked-up cost for a given remedial action component through "Professional Labor Management," or through professional labor assemblies included in the estimate for the remedial action cost component.

"Professional Labor Management" includes the costs of typical professional support activities associated with construction including preparation of site-specific construction activities, incidental permit acquisition, and contract-required deliverables. It also includes typical site-specific professional support activities associated with remedial action including evaluation of sampling and analysis data, comparison of results with project goals, coordination of field activities, and documentation and reporting of field activities. Each cost component has planning and oversight costs associated with it; where professional labor management is not specifically included as a cost sub-component, it is assumed that such cost estimates contain professional labor hours bundled with the cost for implementation of that cost component.

Attachment F-3a-3. Biological Survey and Elderberry Shrub Cluster Relocation - Cost Estimates, UC Davis LEHR/OCL

Biological Survey

Conduct a biological survey assessing selected plant, insect and animal species abundance, assess biotic diversity, and survey endangered/critical species' habitat.

Present findings in an biological survey report.

Elderberry Shrub Cluster Relocation

Elderberry shrub clusters located within areas potentially impacted by remediation will be relocated to the Russell Ranch Mitigation Area, as specified in the UC Davis Long Range Development Plan EIR Mitigation Measure 4.4-6(b).

Assume cost is $270,000 based on previous relocations.

Attachment F-3a-4. Data Gaps Investigation of the Southern Trenches and Hopland Field Station Disposal Area - Cost Estimates, UC Davis LEHR/OCL

Description:

Pre-remedial action characterization study to be conducted in the ST and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two sample per ten-foot length of the trench plus two end-sidewall samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Assumptions:

Southern Trenches

Total Number of Exploratory Trenches	5	
Depth	6	ft
Number of Samples	80	
Analytes:	Ra-226, Ra-228, Sr-90, Cs-137, isotopic uranium, tritium, and C-14	

Hopland Field Station Disposal Area (HFSDA)

Total Number of Exploratory Trenches	3	
Depth	6	ft
Number of Samples	21	
Analytes:	Ra-226, Ra-228, Sr-90, Cs-137, isotopic uranium, tritium, and C-14	

Survey Exploratory Trenches

Three man crew to survey investigation trenches. Registered surveyor report. Assume surveying completed in one day after completion of investigation.

Attachment F-3a-5. Decontamination Facilities - Cost Estimates, UC Davis LEHR/OCL

Decontamination facilities for equipment and personnel during duration of remedial excavation. Include washout for decontamination of trucks leaving Site. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 12 weeks.

Equipment Decontamination Operation Length	12	weeks
(Assume construction will occur over nine months of the year)		
Average crew size	10	
Shifts	1	per day
Safety Level	Level D	

Attachment F-3a-6. Building Decommissioning and Demolition, Building Sampling and Analysis - Cost Estimates, UC Davis LEHR/OCL

Prior to implementation of the alternatives, one Site building will be demolished and disposed off-Site. It is assumed the buildings are contaminated with asbestos, lead, and PCBs. No documentation suggests historical use of radionuclides in the building, therefore, it is assumed it is not radiologically contaminated.
Conduct sampling and analysis of the building that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. Assume 1 sample per 300 ft² of building surfaces. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals.

Total Building Surface Area	2,302	ft²
Number of samples	10	(see backup work below)
Sampling rate	75	samples/day
Crew Size	3	2 radiation technicians + 1 Health and Safety Officer

Analytical:	TCLP (RCRA) (EPA 1311)	H-292 and H-293 will also include:
	Testing, TAL metals (6010/7000s)	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total
	Pesticides/PCBs (SW 3550B/SW 8081/8082)	Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic
	Asbestos in Bulk Solids/Soils (Identification by PLM)	Testing, rad analytical vegetation/sediment/soil, gross alpha, total gas flow proportional counting

Co-60 Annex (H-290)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	1,039	87	3	4
30	21	630	10	5	roof	632	53	2	1
					floor	630	630	23	1
					other building materials (assume 5% of building structure)		38	1	4
					Total	2,302	808	30	10
					Grand Total (all buildings)	2,302	808	30	10

Demolish and dispose building that must be removed to implement remedial action. Assume building is contaminated with asbestos, lead, and PCBs. Demolition waste will be sent off-Site for disposal.

Building

1 Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste. Assume $15/CY for non-hazardous demolition waste.

Building Area	630	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	33	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

Note: A new building will be constructed to replace buildings H-253 and H-290. The replacement is assumed to be 1,830 square feet.

Total Volume of Non-Hazardous Building Demolition Waste to Dispose of Off-Site

33 CY

Total Volume of Hazardous Building Demolition Waste to Dispose of Off-Site

2 CY

Attachment F-3a-8. Clearing and Grubbing - Cost Estimates, UC Davis LEHR/OCL

Clear and Grub	Clear all trees and vegetation within footprint of excavation/cap. Used current satellite photo and photographs from recent field activities to estimate amount of vegetation to clear. Assumed all removed material will be stored on-Site for re-use.	
LFU-1	Disposal	on-site, chipped
	ACRES	2.4 AC
	FLORA DENSITY	light; 5 trees per acre
LFU-2/ET/WBH	Disposal	on-site, chipped
	ACRES	3.5 AC
	FLORA DENSITY	light; 15 trees per acre
LFU-3	Disposal	on-site, chipped
	ACRES	1.0 AC
	FLORA DENSITY	light; 10 trees per acre

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in the ET. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate Exploratory Trenches

ET Trench 24			
Volume		21	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET Trench 26			
Volume		12	BCY
Avg. Depth		7	FT
Source of backfill	Off-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET TRL-45			
Volume		61	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET TRL-48			
Volume		57	BCY
Avg. Depth		10	FT
Source of backfill	Off-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET-T1			
Volume		18	BCY
Avg. Depth		6	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	5	
ET-T2			
Volume		21	BCY
Avg. Depth		6	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	6	
ET-T3			
Volume		21	BCY
Avg. Depth		6	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	6	
ET-T4			
Volume		21	BCY
Avg. Depth		6	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	6	
Total Volume Excavated		324	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		4	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	324	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in LFU-1. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate Exploratory Trenches

LFU-1 TRL-35			
Volume		137	BCY
Avg. Depth		7	FT
Source of backfill	Off-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-1 TRL-36			
Volume		55	BCY
Avg. Depth		6	FT
Source of backfill	Off-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU1-T1			
Volume		38	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T2			
Volume		40	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T3			
Volume		41	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T4			
Volume		57	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	10	
LFU1-T5			
Volume		69	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	11	
LFU1-T6			
Volume		83	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	13	
LFU1-T7			
Volume		80	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	13	
Total Volume Excavated		838	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		6	LCY
Safety Level		Level D	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	838	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in LFU-2. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate Exploratory Trenches

LFU-2 TRL-12			
Volume		11	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-2 TRL-22			
Volume		48	BCY
Avg. Depth		15	FT
Source of backfill	Off-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-2 TRL-20			
Volume		11	BCY
Avg. Depth		6	FT
Source of backfill	Off-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU2-T1			
Volume		174	BCY
Avg. Depth		11	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	19	
LFU2-T2			
Volume		174	BCY
Avg. Depth		11	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	19	
LFU2-T3			
Volume		132	BCY
Avg. Depth		11	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	15	
LFU2-T4			
Volume		132	BCY
Avg. Depth		11	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	15	
Total Volume Excavated		953	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		9	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	953	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate proposed exploratory trenches in LFU-3. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate Exploratory Trenches

LFU3-T1			
Volume		40	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU3-T2			
Volume		44	BCY
Avg. Depth		8	FT
Source of backfill	Off-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	8	
Total Volume Excavated		117	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		1	LCY
Safety Level		Level D	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	117	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-3a-13. Excavation of ET VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate ET VOC "Hot Spot," east and west to depth of 20 feet bgs.

Dispose of excavated hazardous material off-Site. For ET VOC "Hot Spot," west backfill and compact with non-hazardous excavated material. For ET VOC "Hot Spot," east backfill and compact with clear fill.

Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET VOC "Hot Spot," East

Volume		713	BCY
Avg. Depth		20	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		998	LCY
Safety Level		Level C	

Excavate ET VOC "Hot Spot," West

Volume		492	BCY
Avg. Depth		20	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	None, excavated area part of capped CAMU		
Percent to be used as backfill (on-Site)		42	%
Off-Site Backfill Required		400	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,686	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of ET VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-3a-14. Excavation of LFU-2 VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-2 VOC "Hot Spot" to depth of 20 feet bgs. Backfill non-hazardous material in excavation.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate LFU-2 VOC "Hot Spot"

Volume		1,210 BCY
Avg. Depth		20 FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	None, excavated area part of capped CAMU	
Percent to be used as backfill (On-Site)		18 %
Off-Site Backfill Required		1,396 LCY
Safety Level		Level C

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,693 LCY
One Way Haul Distance	500 FT

Land Survey of Excavation

Survey boundaries of LFU-2 VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Materials management includes activities related to the management of excavated soil and solid waste (i.e., stockpiling, sifting/sorting, waste characterization, and staging prior to final disposal).

Bulk Material Storage

Accommodate total excavated volume (TEV) across all subareas to allow for sorting, waste characterization, and staging. Stockpile excavated material in bermed, covered storage area. Safety Level D.

TEV (from subareas excavated under this alternative)	5,943	LCY

Sifting of Excavated Material

Assume rate of sifting = 200 CY/day

Assume the use of similar equipment used under the MEC Sifting assembly. Material will be segregated into PTW, biological waste, and LTW waste streams. Safety Level C.

Soil/solid waste volume (PTW, biological waste, and LTW waste streams):	2,876	LCY
Trommel Screener	1	month
Grizzly Shaker Unit	1	month
Conveyors	1	unit
Refuse Bottom Hopper	1	unit
5'x16' Double tray Vibrating Screening Unit	1	unit
Two full-time equipment operators, oilers (per screening operation)	240	hrs

Loader for Staging Area

One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled material needs to be moved. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

950, 3.0 CY, Wheel Loader (active)	75	hours
950, 3.0 CY, Wheel Loader (standby)	75	hours
Bobcat with Backhoe	1	month
All Terrain Forklift (Monthly Rental)	1	month

Waste Characterization

Assume the included materials and analyses for waste characterization prior to final disposal of excavated materials. Assume 1 sample per 300 CY for costing assumptions, sampling frequency may increase during remedial action.

Material to be characterized:	PTW + VOC "Hot Spot" TEV	
Total Volume	3,403	LCY
Sampling rate	1	sample/300 CY (or 1 sample per container)
Number of samples	12	
Analytical suite:		
Testing, TAL metals (6010/7000s)	257.73	$/sample
TCLP (RCRA) (EPA 1311), Soil Analysis	120.30	$/sample
Testing, soil & sediment analysis, BTEX/gasoline hydrocarbons mod EPA 8020 (PID/FIFD)	107.37	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	234.37	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	278.01	$/sample
Purgeable organics (624, 8260)	126.31	$/sample
Testing, semi-volatile organics, pkd. column (8250)	416.14	$/sample
Testing, paint filter liquids test (9095)	27.90	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, ignitibility (1010)	31.64	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, corrosivity (1110, NACE)	26.04	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, reactivity (cyanide/sulfide)	72.65	$/sample
Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic	133.34	$/sample
Testing, rad analytical, additional services, characterization of any unknown rad sample (low level)	194.36	$/sample

Drum Staging

Drums for PTW laboratory waste (lab pack) disposal. Includes characterization of wastes in drums. Assume number of drums = volume of PTW in LCY divided by four. Safety Level C.

Total PTW	38	LCY
Store PTW in bulk container	2	containers (30 CY capacity)
Number of drums	10	drums
Percentage Full	65	%
Temporary Storage Area	112	ft²
Overpacks	85 gal. steel salvage drum	
Waste characterization	1 sample per drum, liquid waste characterization template	

Attachment F-3a-16. Off-Site Transportation and Disposal - Cost Estimates, UC Davis LEHR/OCL

	LLRW (LCY)	**Mixed Waste** (LCY)	**RCRA Hazardous** (LCY)	**Non-RCRA Hazardous** (LCY)	**Non-Hazardous** (LCY)	**Building Hazardous** (LCY)	**Building Non-Hazardous** (LCY)	**Drums/Lab Pack** (number of drums)
Distance to disposal facility	594 miles	594 miles	227 miles	227 miles	93 miles	227 miles	93 miles	594 miles
Volume*	1,322	69	692	276	0	2	33	
Volume for Incineration**	0	0	0	0	0	0	0	
Final Disposal Volumes	**1,322**	**69**	**692**	**276**	**0**	**2**	**33**	**10**

* See Table E-13 (Appendix E, FS - Volume 1).
** Biological waste only.

Attachment F-3a-17. Grade and Revegetate LFU-1 - Cost Estimates, UC Davis LEHR/OCL

Description: Grade LFU-1 to a minimum 1.5% slope to facilitate storm water runoff away from land disposal unit and revegetate with native grasses to promote evapotranspiration.

Major Assumptions:

Area: 2.0 acres

Slope: 1.5%

Volume of fill required to create slope:	5,089 LCY
On-Site source:	373 LCY
Off-Site source:	4,716 LCY

Survey:

Survey crew to delineate boundaries of graded land disposal unit and ensure proper slope. Licensed surveyor report. 3 man survey crew - 2 half-days. Licensed surveyor report.

Attachment F-3a-18. Grade and Revegetate LFU-2/ET/WBH - Cost Estimates, UC Davis LEHR/OCL

Description: Grade LFU-2/ET/WBH to a minimum 1.5% slope to facilitate storm water runoff away from land disposal unit and revegetate with native grasses to promote evapotranspiration.

Major Assumptions:

Area:	3.5	acres
Slope:	1.5%	
Volume of fill required to create slope:	6,658	LCY
On-Site source:	712	LCY
Off-Site source:	5,946	LCY

Survey:

Survey crew to delineate boundaries of graded land disposal unit and ensure proper slope. Licensed surveyor report. 3 man survey crew - 2 half-days. Licensed surveyor report.

Attachment F-3a-19. Grade and Revegetate LFU-3 - Cost Estimates, UC Davis LEHR/OCL

Description:

Grade LFU-3 to a minimum 1.5% slope to facilitate storm water runoff away from land disposal unit and revegetate with native grasses to promote evapotranspiration.

Major Assumptions:

Area: 0.71 acres

Slope: 1.5%

Volume of fill required to create slope:	1,808 LCY
On-Site source:	603 LCY
Off-Site source:	1,204 LCY

Surveying of Area:

Survey crew to delineate boundaries of graded land disposal unit and ensure proper slope. Licensed surveyor report. 3 man survey crew - 2 half-days. Licensed surveyor report.

Attachment F-3a-20. Install New Groundwater Wells - Cost Estimates, UC Davis LEHR/OCL

Groundwater Monitoring Well Installation - Nine HSU-1 groundwater monitoring wells would be installed. The wells will have screen/sand pack intervals of seven feet or less to minimize their potential to act as vertical conduits for downward COC migration, and will be completed just below the bottom of the depth range of seasonal water table fluctuation.

9 wells, 70 ft depth, 2" diameter, PVC Schedule 80
Dispose drill cuttings as non-hazardous waste
Survey and develop completed wells

Three groundwater monitoring wells (UCD1-008, UCD1-013, and UCD2-014) would be extended so they are flush with the newly graded ground surface in the ET area. Assume extension would be less than one foot.

LFU-1 Storm Drainage

North-south trending concrete drainage ditch will be constructed to east of LFU-1 graded area.

Lining:	concrete	
Length	400	feet

LFU-3 N-S Drainage Channel

North-south trending concrete-lined drainage channel will be repaired/re-sealed to prevent infiltration through cracks.

Length	270	ft
Top Width	30	ft
Bottom Width	16	ft
Depth	7	ft
Surface Area	10,850	ft^2

Assume 50% of channel surface to be repaired.

LFU-3 E-W Drainage Ditch

Re-route the east-west vegetated drainage ditch to the south of LFU-3. Install new culvert to discharge into north-south, concrete-lined drainage channel.

Lining:	soil/vegetation	
Length	260	ft
Top Width	15	ft
Depth	3	ft
Erosion Controls - Geotextile	212	yd^2
Erosion Controls - Rip-rap	16	CY

LFU-1/LFU-2/ET/WBH Collection and Conveyance System, Lift Station and Extended Detention Basin

Size Basin					
(d) Depth	4	ft	Area HDPE liner	9,550	ft^2
(l) Length	100	ft			
(w_b) Bottom Width	20	ft			
(w_t)Top Width	50	ft			
(V) Volume	14,000	ft^3			
	519	CY			
Length of piping:					
to detention basin	2,500	ft			
discharge from basin	630	ft			
Number of lift stations:	2		One north of LFU-2 to pump water to detention basin, one east of detention basin to pump toward discharge at LFU-1.		
Peak flow:	0.35	cfs			

LFU-3 Collection and Conveyance System, Lift Station and Extended Detention Basin

Size Basin					
(d) Depth	3	ft	Area HDPE liner	3,120	ft^2
(l) Length	50	ft			
(w_b) Bottom Width	5	ft			
(w_t)Top Width	25	ft			
(V) Volume	2,250	ft^3			
	83	CY			
Length of piping:					
to detention basin	920	ft			
discharge from basin	110	ft			
Number of lift stations:	1		On north side of LFU-3 to pump water to detention basin		
Peak flow:	0.35	cfs			

Survey :

Survey newly constructed drainage channels and detention basins. 2 half-days. Registered surveyor report.

Attachment F-3a-22. O&M: Institutional Controls - Cost Estimates, UC Davis LEHR/OCL

Survey Site to establish legal boundaries.
Implement and maintain institutional/land use controls.
Document landfill locations and prohibit Site development or activities incompatible with designated land use.

		# meetings	# people	# days	airfare	mileage to meeting site
Planning Documents	LUC Assurance Plan	2	2	1	0	70
	LUC Implementation Plan	2	2	1	0	70
	Construction Permitting	1	1	1	0	70
	Geographic Information Systems/Overlay Maps	1	1	1	0	70
Implementation	Deed Notification	1	unit			
	Restrictive Covenants	1	unit			
	Access Control Signs	22	unit	Assume one sign every 150 feet around perimeter of land disposal units		
	Utility Notification Service	1	unit			
	GIS/Overlay maps	1	unit			
Monitoring and Enforcement						
	Duration of monitoring/enforcement	100	YRS (or lifetime of alternative)			
	Reports & Certifications	1	per year			
	Site Visits/Inspections	1	per year			
Survey:	5 days, licensed surveyors' report					

Attachment F-3a-23. O&M: Groundwater and Storm Water Monitoring - Cost Estimates, UC Davis LEHR/OCL

Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the land disposal units according to Table 5-3. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, semivolatile organic compounds (1,4-dioxane by single ion monitoring) CAM 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three designated storm water sampling locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. The groundwater and storm water monitoring period will continue throughout the lifetime of the alternative until Site cleanup goals are achieved.

Includes data validation, electronic data import, data management and monitoring reports.
19 wells to be included.

Attachment F-3a-24. O&M of Storm Water Drainage Infrastructure - Cost Estimates, UC Davis LEHR/OCL

Assume annual maintenance costs for lift station and drainage channels of $6,000/year for lifetime of drainage system.
Includes detention basins and associated infrastructure, LFU-1 drainage swale, LFU-3 drainage channels

Periodic costs incurred every ten years for repair/replacement of lift station pumps (3 lift stations).

Attachment F-3a-25. O&M of Graded Areas - Cost Estimates, UC Davis LEHR/OCL

Inspect and repair evapotranspiration cap for lifetime of cap.
Maintenance includes import of additional topsoil, seeding (1 acre), fertilization/spraying, mowing on an annual basis.
RACER bases costs on total area of caps.

Total Graded Area:	6.2	acres

Attachment F-3a-26. Periodic Costs: Five Year Reviews - Cost Estimates, UC Davis LEHR/OCL

Review and update all documents associated with compliance, performance, institutional/land use controls. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews for period of 30 years

Document Review		
	Interviews	Current and Previous Staff Management
		Community Groups
		State Contacts
		Local Government Contacts
		Operations & Maintenance Contractors
		PRPs
		Remedial Design Consultant
	Site Inspection	General Site Inspection
		Containment System Inspection
		Monitoring Systems Inspection
		Treatment Systems Inspection
		Regulatory Compliance
		Site Visit Documentation (Photos, Diagrams, etc.)
	Report	

Attachment F-3a-27. Contingent Action: Grade and Revegetate ST and HFSDA - Cost Estimates, UC Davis LEHR/OCL

Description:

Contingency cost: Grade LFU-3 to a minimum 1.5% slope to facilitate storm water runoff away from land disposal unit and revegetate with native grasses to promote evapotranspiration. Add cost as contingency, assume cost equals half the cost of grading LFU-3 (based on area).

Major Assumptions:

Area: 0.35 acres

Slope: 1.5%

Surveying of Area:

Survey crew to delineate boundaries of graded land disposal units and ensure proper slope. Licensed surveyor report. 3 man survey crew - 2 half-days. Licensed surveyor report.

ATTACHMENT F-3b

ALTERNATIVE SW-3 ESTIMATE DOCUMENTATION REPORT

Estimate Documentation Report

System:

RACER Version: 10.3.0
Database Location: C:\Documents and Settings\gch\Application Data\AECOM\RACER 10.3\Racer.mdb

Folder:

Folder Name: Alternative SW-3

Project:

Project ID: FS_Cost
Project Name: Feasibility Study Cost Estimate
Project Category: Detailed Analysis of FS Alternatives

Location
State / Country: CALIFORNIA
City: SACRAMENTO

Location Modifier	Default	User
	1.203	1.203

Options
Database: Modified System
Cost Database Date: 2010
Report Option: Calendar

Description
Cost estimates in support of the CERCLA Feasibility Study for University of California, Davis areas of responsibility at the Laboratory for Energy-Related Health Research/Old Campus Landfill Site. Use Modified System Costs to add custom cost assemblies.

Estimate Documentation Report

Site Documentation:

Site ID: LEHR/OCL
Site Name: Alternative SW-3
Site Type: Land Disposal Units

Media/Waste Type

Primary: Soil
Secondary: N/A

Contaminant

Primary: Multi-Contaminant
Secondary: Radioactive (Low Level)

Phase Names

Pre-Study:
Study:
Design:
Removal/Interim Action:
Remedial Action:
Operations & Maintenance:
Long Term Monitoring:
Site Closeout:

Documentation

Description: Alternative SW-3. VOC "Hot Spot" Removal, Three On-Site Corrective Action Management Units with Graded Covers, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring.

See Section 5 of the FS for a description of this alternative.

Support Team: Weiss Staff
References: RACER 2010 System Costs Database

Estimate Documentation Report

Estimated Costs:

Phase Names	Direct Cost	Marked-up Cost
Biological Survey	$34,759	$86,304
Data Gap Investigation	$84,226	$157,394
Decontamination Facilities	$89,440	$195,984
Institutional Controls	$445,672	$1,039,283
Building D&D	$60,764	$94,688
Clearing and Grubbing	$28,374	$52,025
Elderberry Mitigation	$270,000	$270,000
ET VOC "Hot Spot" Excavation	$144,981	$234,122
Materials Management	$278,310	$472,652
ET PTW and Exploratory Trench Excavation	$82,251	$125,480
LFU-1 PTW and Exploratory Trench Excavation	$198,308	$285,662
LFU-2 VOC "Hot Spot" Excavation	$120,836	$196,258
LFU-2 PTW and Exploratory Trench Excavation	$211,256	$310,177
LFU-3 PTW and Exploratory Trench Excavation	$50,379	$72,889
Grading and Revegetating of LFU-1	$164,068	$256,367
Grading and Revegetating of LFU-2, ETs, WBHs	$245,215	$383,333
Grading and Revegetating of LFU-3	$56,695	$88,118
LFU-3 Drainage Channels	$29,371	$51,820
Off-Site Transportation and Disposal	$1,908,275	$2,291,553
Install New GW Monitoring Wells	$78,051	$118,168
LFU-1 Drainage Channel	$24,731	$29,823
Storm Drainage	$430,015	$691,009
Groundwater and Storm Water Monitoring	$3,120,305	$4,198,648
O&M Drainage System	$6,000	$6,000
O&M of Graded Areas	$290,107	$606,260
Five-Year Reviews	$63,558	$159,250
Periodic Storm Water Lift Station Repair	$2,677	$4,012
Total Cost:	$8,518,624	$12,477,278

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Biological Survey
Description: Perform biological survey of Site prior to remedial action to assess population abundance and diversity of selected plant and animal species.

Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
RCRA Facility Investigation	Yes	100	0

Total Marked-up Cost: $86,304

Technologies:

Estimate Documentation Report

Technology Name: **RCRA Facility Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		No	n/a
Other Investigations		No	n/a
Site Distance		70	MI
Site Complexity		Low	n/a
Site Charact.			
Required Parameters			
Fieldwork Support		No	n/a
Evaluate Site Geology/Hydrogeology		No	n/a
Evaluate Site Soils/Surface Hydrology		No	n/a
Evaluate Site Meteorology		No	n/a
Evaluate Populations and Land Usage		No	n/a
Evaluate Site Ecology		Yes	n/a
Evaluate Nature and Extent of Contamination		No	n/a
Evaluate Contaminant Fate and Transport		No	n/a
Conduct Baseline Risk Assessment		No	n/a
Compose RFI Report		Yes	n/a

Comments: On-Site biological survey with particular emphasis on threatened and endangered species prior to commencement of any remedial activities.

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Data Gap Investigation
Description: Pre-remedial action characterization study to be conducted in the Southern Trenches and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two samples per ten-foot length of the trench plus two end-sidewall samples and additional QA/QC samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY	Yes	5	95
Site Inspection	Yes	100	0

Total Marked-up Cost: $157,394

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey investigation trenches. Registered surveyor report. Assume surveying completed in one day after completion of all trenches.

Estimate Documentation Report

Technology Name: **Site Inspection (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Planning		Yes	n/a
Site Investigation		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		Yes	n/a
Site Distance		70	MI
Site Complexity		Moderate	n/a
Planning			
Required Parameters			
Data Review		Yes	n/a
SI Work Plan		Yes	n/a
SI Supplemental Plans (Health and Safety,		Yes	n/a
Site Investigation			
Required Parameters			
Provide Fieldwork Support		Yes	n/a
Data Validation		Yes	n/a
Compose SI Report		Yes	n/a
Complete Revised HRS Scoring Package		Yes	n/a
Implement Community Relations		Yes	n/a
S&A			
Required Parameters			
Bioassays		No	n/a
Crew Size		2 Field Technicians	n/a
Include QA/QC Samples		Yes	n/a
Groundwater		No	n/a
Surface Water		No	n/a
Sampling - Water: Primary Analytical Template		None	n/a
Sampling - Water: Secondary Analytical Template		None	n/a
Surface Soil		No	n/a
Subsurface Soil		Yes	n/a
Sediment		No	n/a
Sampling - Soil/Sediment: Primary Analytical Template		System Soil - Low Level Radioactive	n/a

Estimate Documentation Report

Technology Name: **Site Inspection (# 1)**

Description	*Default*	*Value*	*UOM*
S&A			
Required Parameters			
Sampling - Soil/Sediment: Secondary Analytical Template		None	n/a
Air		No	n/a
Soil Gas		No	n/a
Sampling - Air/Soil Gas: Primary Analytical Template		None	n/a
Sampling - Air/Soil Gas: Secondary Analytical Template		None	n/a
Media			
Required Parameters			
Subsurface Soil: Avg. Sample Depth		12	FT
Subsurface Soil: # Sampling Locations		8	EA
Subsurface Soil: # Samples per Location		13	EA
Subsurface Soil: # Rounds		1	EA
Methodology			
Required Parameters			
Methodology: Subsurface Soil	Power Auger	Air Rotary Rig	n/a
Methodology: Turnaround Time		Standard (21 Days)	n/a
Methodology: Quality Control		Level 4	n/a

Comments: Pre-remedial action characterization study to be conducted in the Southern Trenches and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two sample per ten-foot length of the trench plus two end-sidewall samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decontamination Facilities
Description: Provide decontamination facilities for equipment and personnel throughout duration of the remedial action.

Approach: Ex Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Decontamination Facilities	Yes	100	0

Total Marked-up Cost: $195,984

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		186,651	$
Percentage	19.8	5	%
Dollar Amount		9,333	$

Comments:

Estimate Documentation Report

Technology Name: **Decontamination Facilities (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
New Decontamination Facility Pad Construction		No	n/a
Equipment Rating		n/a	n/a
Equipment Decontamination Operations		Yes	n/a
Equipment Decontamination Operations: Duration		12	weeks
Personnel Decontamination Trailers		Yes	n/a
Personnel Decontamination Trailers: Average Crew Size		10	per shift
Personnel Decontamination Trailers: Duration		12	weeks
Safety Level		D	n/a
Work Shifts			
Secondary Parameters			
Equipment Decontamination	One Shift per Day		n/a
Personnel Decontamination	One Shift per Day		n/a

Comments: Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 12 weeks.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Institutional Controls
Description: Implement and maintain Institutional/Land Use Controls to prohibit Site development or activities incompatible with designated land use.

Approach: In Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
INITIAL LAND SURVEY	Yes	5	95
ADMINISTRATIVE LAND USE CONTROLS	Yes	100	0

Total Marked-up Cost: $1,039,283

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **INITIAL LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		INITIAL LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew to establish legal boundaries defining the Site's boundaries. Licensed surveyor report. 3 man survey crew - 5 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Rename Model		ADMINISTRATIVE LAND USE CONTROLS	n/a
Planning Documents		Yes	n/a
Planning Documents: Start Date		2010	n/a
Implementation		Yes	n/a
Implementation: Start Date		2010	n/a
Monitoring & Enforcement		Yes	n/a
Monitoring & Enforcement: Start Date		2010	n/a
Modification/Termination		No	n/a
Type of Site		Former Government Site	n/a
Planning Documents			
Required Parameters			
LUC Assurance Plan (LUCAP)		Yes	n/a
LUC Assurance Plan (LUCAP): Plan Complexity		Medium	n/a
LUC Implementation Plan (LUCIP)		Yes	n/a
LUC Implementation Plan (LUCIP): Number		1	EA
LUC Implementation Plan (LUCIP): Plan Complexity		Medium	n/a
Long-term Stewardship (LTS) Plan		No	n/a
Memorandum of Agreements (MOA)		No	n/a
Installation (or City) Master Plan		No	n/a
Construction Permitting		Yes	n/a
Construction Permitting: Number		1	EA
Construction Permitting: Plan Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Plan Complexity		Low	n/a
Planning Meetings			
Required Parameters			
LUCAP: Number of Meetings		2	EA
LUCAP: Number of People		2	EA

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Planning Meetings			
Required Parameters			
LUCAP: Number of Days		1	EA
LUCAP: Airfare Cost		0	$
LUCAP: Mileage to Meeting Site		70	MI
LUCIP: Number of Meetings		2	EA
LUCIP: Number of People		2	EA
LUCIP: Number of Days		1	EA
LUCIP: Airfare Cost		0	$
LUCIP: Mileage to Meeting Site		70	MI
Construction Permitting: Number of Meetings		1	EA
Construction Permitting: Number of People		1	EA
Construction Permitting: Number of Days		1	EA
Construction Permitting: Airfare Cost		0	$
Construction Permitting: Mileage to Meeting Site		70	MI
GIS/Overlay Maps: Number of Meetings		1	EA
GIS/Overlay Maps: Number of People		1	EA
GIS/Overlay Maps: Number of Days		1	EA
GIS/Overlay Maps: Airfare Cost		0	$
GIS/Overlay Maps: Mileage to Meeting Site		70	MI
Implementation			
Required Parameters			
Modify Installation (or City) Master Plan		No	n/a
Deed Notification		Yes	n/a
Deed Notification: Number		1	EA
Deed Notification: Task Complexity		Low	n/a
Negotiating Easements		No	n/a
Restrictive Covenants		Yes	n/a
Restrictive Covenants: Number		1	EA
Restrictive Covenants: Task Complexity		Low	n/a
Equitable Servitudes		No	n/a
Access Control Signs		Yes	n/a

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Implementation			
Required Parameters			
Access Control Signs: Number		22	EA
Access Control Signs: Task Complexity		Low	n/a
Utility Notification Service		Yes	n/a
Access Control Signs: Number		1	EA
Access Control Signs: Task Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Task Complexity		Low	n/a
Develop Finding of Suitability to Transfer (FOST)		No	n/a
Monitoring & Enforcement			
Required Parameters			
Duration of Monitoring/Enforcement		31	Years
Notice Letters		No	n/a
Guard Service/Security		No	n/a
Reports & Certifications		Yes	n/a
Reports & Certifications: Frequency		Annually	n/a
Site Visits/Inspections		Yes	n/a
Site Visits/Inspections: Number		1	EA
Site Visits/Inspections: Safety Level		D	n/a
Site Visits/Inspections: Duration		1	Days
Site Visits/Inspections: Number of People		2	EA
Site Visits/Inspections: Frequency		Annually	n/a
Site Visits/Inspections: Airfare		0	$ Per Ticket
Site Visits/Inspections: Mileage		70	MI

Comments: Implement and maintain land use controls to prohibit Site development or activities incompatible with designated land use.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building D&D
Description: Prior to implementation of the alternative, nine Site buildings will be demolished and associated hazardous demolition material will be disposed off-Site. It is assumed that five percent of the demolition waste is contaminated with asbestos, lead, and PCBs. Non-hazardous building material will be recycled or disposed of in an on-Site CAMU. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated.
Apply 15% contingency for worker safety and additional waste volume.

Approach: Ex Situ
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Demolition, Buildings	Yes	10	90
Professional Labor Management	Yes	100	0
D&D, Sampling and Analysis	Yes	100	0

Total Marked-up Cost: $94,688

Technologies:

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		630	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		33.25	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		1.75	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		67,964	$
Percentage	20	20	%
Dollar Amount		13,593	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Mobilizations		1	EA
Mobilization Distance		70	MI (One-way)
Soil/Sediment: # of Samples		0	EA
Soil/Sediment: Survey Area		0	SF
Water/Liquid: # of Samples		0	EA
Water/Liquid: Survey Area		0	SF
Building Surfaces: # of Samples		10	EA
Building Surfaces: Survey Area		2,302	SF
Sampling Rate		75	Per Day
Sampling Crew Size		2 Radiation Technicians, 1 Health and Safety Officer	n/a
Safety Level		D	n/a
Laboratory Analyses			
Required Parameters			
Soil: Alpha		No	n/a
Soil: Beta		No	n/a
Soil: Gamma		No	n/a
Soil: VOC"s		No	n/a
Soil: SVOC"s		No	n/a
Soil: Fuels		No	n/a
Soil: Pesticides		No	n/a
Soil: PCB"s		No	n/a
Soil: Metals		No	n/a
Soil: Acids/Caustics		No	n/a
Soil: Ordnance Residual		No	n/a
Water: Alpha		No	n/a
Water: Beta		No	n/a
Water: Gamma		No	n/a
Water: VOC"s		No	n/a
Water: SVOC"s		No	n/a

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Laboratory Analyses			
Required Parameters			
Water: Fuels		No	n/a
Water: Pesticides		No	n/a
Water: PCB"s		No	n/a
Water: Metals		No	n/a
Water: Acids/Caustics		No	n/a
Water: Ordnance Residual		No	n/a
Building: Alpha		No	n/a
Building: Beta		No	n/a
Building: Gamma		No	n/a
Building: VOC"s		No	n/a
Building: SVOC"s		No	n/a
Building: Fuels		No	n/a
Building: Pesticides		No	n/a
Building: PCB"s		Yes	n/a
Building: Metals		Yes	n/a
Building: Acids/Caustics		No	n/a
Building: Ordnance Residual		No	n/a
QA Blanks: Soil/Sediment		0	%
QA Blanks: Water/Liquid		0	%
QA Blanks: Building		15	%
Hand Scanning		1	Days
Adjustments/Productivity			
Secondary Parameters			
Turnaround Time		Standard (21 Days)	n/a
Quality Control		Level 1	n/a
Height Adjustment	15	15	%
Protective Clothing	23	23	%
RADCON	15	15	%
Respiratory Protection	38	38	%
Breaks	10	10	%

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Adjustments/Productivity			
Secondary Parameters			
Productivity Loss Multiplier	2.32	n/a	n/a

Comments: Conduct sampling and analysis of the Cobalt-60 Annex (H-290) that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. One sample per ~300 ft2. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET VOC "Hot Spot" Excavation
Description: Excavate ET VOC "Hot Spot." Apply 15% contingency for radiological work and backfill requirements.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Excavation	Yes	5	95

Total Marked-up Cost: $234,122

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Eastern Trenches VOC "Hot Spot" excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,686	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring (included under Professional Labor Management).

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		184,288	$
Percentage	19.8	19.8	%
Dollar Amount		36,489	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		713	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	58	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	6	6	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate the ET VOC "Hot Spot," East to a depth of 20 feet bgs. Backfill with clean fill.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		492	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	63	42	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate ET VOC "Hot Spot," West.

Excavation to be backfilled and compacted with Site consolidated soil/solid waste.
Level C PPE assumed because of potential VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Clearing and Grubbing
Description: Clear and grub areas to be excavated and/or capped.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80

Total Marked-up Cost: $52,025

Technologies:

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		2.42	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		424.830993652344	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 1 footprint.
Current satellite photo and photographs from recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume grubbed material will be kept on-site for re-use.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		3.48	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		610.914001464844	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 2/Eastern Trenches/Waste Burial Holes footprint.
Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume chipping and stockpiling is done on-site.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		1.01	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		177.30549621582	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear trees and vegetation at Landfill Unit 3. Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range. Assume grubbed material is stored and re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Elderberry Mitigation
Description: Identify elderberry shrub clusters within work boundaries and relocate them within UC boundaries.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ELDERBERRY SHRUB CLUSTER RELOCATION	No	0	0

Total Marked-up Cost: $270,000

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **ELDERBERRY SHRUB CLUSTER RELOCATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ELDERBERRY SHRUB CLUSTER RELOCATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.02	n/a
Safety Level		D	n/a

Comments: Cost for Elderberry mitigation based on previous transplanting operations at UC Davis.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Materials Management
Description: Excavated material will be handled in accordance with a Materials Management Plan. Materials Management includes the cost of storage/stockpiling, sorting of waste streams, waste characterization, and staging for final disposal. Disposal is handled in a separate cost element. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Drum Staging	Yes	20	80
LOADER FOR STAGING AREA	Yes	0	100
WASTE CHARACTERIZATION SAMPLING	Yes	100	0
Professional Labor Management	Yes	80	20
Bulk Material Storage	Yes	20	80
Bulk Material Storage	Yes	20	80
SIFTING OF EXCAVATED MATERIAL	Yes	20	80

Total Marked-up Cost: $472,652

Technologies:

Estimate Documentation Report

Technology Name: **Drum Staging (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Waste		Solid	n/a
Solid: To be Staged		10	EA
Solid: Leaking/Damaged Requiring Overpacks		0	EA
Solid: To be Sampled		10	EA
Solid: Second Sample per Drum		No	n/a
Temporary Staging Area		112	SF
Drums to be Consolidated (Drums to Bulk)		10	EA
Drum Average Percentage Full		65	%
Safety Level		C	n/a
Handling			
Secondary Parameters			
Overpacks		85 Gal. Steel Salvage Drum	n/a
First Sample Analysis: Liquid		Waste Characterization, Liquid	n/a
First Sample Analysis: Solid / Sludge		Waste Characterization, Solids	n/a
Second Sample Analysis: Liquid		None	n/a
Second Sample Analysis: Solid / Sludge		None	n/a
Storage			
Secondary Parameters			
Liner/Temporary Staging Area	60 Mil Polymeric Liner, HDPE	60 Mil Polymeric Liner, HDPE	n/a
Drum Storage Systems: Quantity	0	0	EA
Drum Storage Systems: Type	Poly Spill Pallet, 4 Drum Cap	Poly Spill Pallet, 4 Drum Cap	n/a
Containment Berms: Quantity	0	0	EA
Containment Berms: Type	10" x 10" x 17", 750 Gallon	10" x 10" x 17", 750 Gallon	n/a

Comments: Drums for principal threat wastes/lab packs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LOADER FOR STAGING AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LOADER FOR STAGING AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled dirt needs to be moved around. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

Technology Name: **User Defined Estimate (# 2)**
User Name: **WASTE CHARACTERIZATION SAMPLING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WASTE CHARACTERIZATION SAMPLING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.06	n/a
Safety Level		D	n/a

Comments: Assume the included materials and analyses for waste characterization prior to final disposal of PTW and VOC "Hot Spot" TEV.
Assume 1 sample per 300 CY for costing purposes only. Actual sampling rate will be considered during remedial design.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		148,973	$
Percentage	19.9	19.9	%
Dollar Amount		29,646	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Bulk Material Storage (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Roll-Off/Bulk Containers/Tanks	n/a
Quantity of Material		38	CY
Safety Level		C	n/a
Secondary			
Secondary Parameters			
Size	30 CY Open Top Roll-Off Container	30 CY Open Top Roll-Off Container	n/a
Quantity	2	2	n/a

Comments: Bulk containers for PTW.

Estimate Documentation Report

Technology Name: **Bulk Material Storage (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Soil Bermed Storage Area	n/a
Quantity of Material		5,943	CY
Safety Level		D	n/a
Secondary			
Secondary Parameters			
Storage Area Quantity	1	1	EA
Storage Area Length	143	143	FT
Storage Area Width	143	143	FT
Berm Height	2	2	FT
Berm Top Width	2	2	FT
Slope: Feet Run / 1 Foot Rise	3	3	FT
Polymeric Liner Material	40 Mil Polymeric Liner, PVC	40 Mil Polymeric Liner, PVC	n\a
Polymeric Liner Quantity	1	1	EA
Soil Liner Material	None	None	n/a
Soil Liner Thickness	0	0	IN
Liner Protection Layer Material	Gravel	Gravel	n/a
Liner Protection Layer Thickness	12	12	IN

Comments: Stockpile TEV.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **SIFTING OF EXCAVATED MATERIAL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		SIFTING OF EXCAVATED MATERIAL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.90	n/a
Safety Level		C	n/a

Comments: Sorting of excavated material to segregate principal threat wastes. Assume the use of similar equipment used under the MEC Sifting assembly. Assume rate of sorting is approximately 200 CY/day.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 PTW and Exploratory Trench Excavation
Description: Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added volume of excavation, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $72,889

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		40	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU3-T1 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		44	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	59	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	8	EA
Number of Composites Submitted to Lab	5	8	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU3-T2 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		47,507	$
Percentage	20.1	20.1	%
Dollar Amount		9,549	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		117	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		1	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added excavation volume, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $125,480

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	67	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET Trench 24 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		12	CY
Depth		7	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	69	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET Trench 26 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		61	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	55	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET TRL-45 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		57	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	64	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET TRL-48 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		18	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	59	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	5	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T1 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	6	EA
Number of Composites Submitted to Lab	5	6	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T2 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	6	EA
Number of Composites Submitted to Lab	5	6	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T3 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	6	EA
Number of Composites Submitted to Lab	5	6	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T4 PTW excavation.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		92,637	$
Percentage	20	20	%
Dollar Amount		18,527	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		324	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		0.5	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added excavation volume, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $285,662

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		83	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	51	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	13	EA
Number of Composites Submitted to Lab	5	13	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T6 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		80	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	51	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	13	EA
Number of Composites Submitted to Lab	5	13	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T7 PTW excavation

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		216,462	$
Percentage	19.7	19.7	%
Dollar Amount		42,643	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		838	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		137	CY
Depth		7	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	40	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-35 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		55	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	45	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-36 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		38	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T1 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		40	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T2 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		41	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T3 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		57	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	56	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	10	EA
Number of Composites Submitted to Lab	5	10	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T4 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		69	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	53	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	11	EA
Number of Composites Submitted to Lab	5	11	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T5 PTW excavation

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		2.4	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added volume of excavation, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $310,177

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		132	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	15	EA
Number of Composites Submitted to Lab	5	15	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T3 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		132	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	15	EA
Number of Composites Submitted to Lab	5	15	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T4 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		236,412	$
Percentage	19.7	19.7	%
Dollar Amount		46,573	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		953	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		11	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	74	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-2 TRL-12 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		48	CY
Depth		15	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	78	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-22 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		11	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	65	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-2 TRL-20 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		174	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	54	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	19	EA
Number of Composites Submitted to Lab	5	19	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T1 excavation. Collect soil/solid waste samples.

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		174	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	54	98	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	19	EA
Number of Composites Submitted to Lab	5	19	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T2 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		2.2	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 VOC "Hot Spot" Excavation
Description: Excavate LFU-2 VOC "Hot Spot." Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $196,258

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,210	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	52	18	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate the LFU-2 VOC "Hot Spot" to a depth of 20 feet bgs.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,693	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul LFU-2 VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		152,681	$
Percentage	19.8	19.8	%
Dollar Amount		30,231	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Grading and Revegetating of LFU-1
Description: Grade soil over LFU-1 as a cover, creating a 1.5% minimum slope, and plant with native grasses. Dispose non-hazardous waste generaged by construction activities. Survey boundaries of graded area. Add non-PTW excavated during construction of LFU-1 drainage channel to covered area. 10% contingency.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
GRADE AROUND LFU-1 TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Off-site Transportation and Waste Disposal	Yes	5	95
LAND SURVEY OF LFU-1 GRADED AREA	Yes	5	95
Capping	Yes	20	80

Total Marked-up Cost: $256,367

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **GRADE AROUND LFU-1 TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND LFU-1 TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around LFU-1 to promote drainage into constructed storm drain which will connect to discharge point at LFU-1.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		206,993	$
Percentage	19.7	19.7	%
Dollar Amount		40,778	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		5	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-1 soil grading activities. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF LFU-1 GRADED AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF LFU-1 GRADED AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Licensed surveyor report. 3 man survey crew - 2 x 1/2 day. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		Dermal Cover	n/a
Acres		1.97	AC
Length		414	FT
Width		207	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	50	n/a
Horizontal Projection of Side Slope	52	0	FT
Horizontal Projection of Top Slope	52	104	FT
Dermal Cover			
Secondary Parameters			
Top Cover Type	Vegetation	Vegetation	n/a
Soil Cover Thickness	6	6	IN
Soil Cover Borrow Source	Off-site	Off-site	n/a
Foundation Layer Thickness	12	9	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a

Comments: Grade LFU-1 area. Import fill required to achieve minimum 1.5% slope. Use combination of import fill and on-Site material to achieve slope.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Grading and Revegetating of LFU-2, ETs, WBHs
Description: Grade soil over LFU2, ETs and WBHs as a cover, creating a 1.5% minimum slope, and plant with native grasses. Dispose non-hazardous waste generaged by construction activities. Survey boundaries of graded area.
Assumes 10% contingency.

Approach: In Situ
Start Date: June, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF LFU-2/ET/WBH GRADED AREA	Yes	5	95
Off-site Transportation and Waste Disposal	Yes	5	95
GRADE AROUND CAP TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Capping	Yes	20	80

Total Marked-up Cost: $383,333

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF LFU-2/ET/WBH GRADED AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF LFU-2/ET/WBH GRADED AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Licensed surveyor report. 3 man survey crew - 2 x 1/2 day. Licensed surveyor report.

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		5	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-2/ET/WBH soil cover construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **GRADE AROUND CAP TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND CAP TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around soil cover to promote drainage.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		313,587	$
Percentage	19.5	19.5	%
Dollar Amount		61,149	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		Dermal Cover	n/a
Acres		3.48	AC
Length		551	FT
Width		275	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	50	n/a
Horizontal Projection of Side Slope	69	138	FT
Horizontal Projection of Top Slope	69	0	FT
Dermal Cover			
Secondary Parameters			
Top Cover Type	Vegetation	Vegetation	n/a
Soil Cover Thickness	6	6	IN
Soil Cover Borrow Source	Off-site	Off-site	n/a
Foundation Layer Thickness	12	6	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a

Comments: Grade soil over LFU-2/WBH/ET area to a minimum of 1.5% slope. Plant native grasses to promote evapotranspiration. Use combination of import fill and on-Site material to achieve slope.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Grading and Revegetating of LFU-3
Description: Grade soil over LFU-3 as a cover, creating a 1.5% minimum slope, and plant with native grasses. Dispose non-hazardous waste generated by construction activities. The existing E-W drainage channels will be re-routed to the south. Survey boundaries of graded area. Assumes 10% contingency.

Approach: In Situ
Start Date: June, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF LFU-3 GRADED AREA	Yes	5	95
Capping	Yes	20	80
GRADE AROUND LFU-3 TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Off-site Transportation and Waste Disposal	Yes	5	95

Total Marked-up Cost: $88,118

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF LFU-3 GRADED AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF LFU-3 GRADED AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Licensed surveyor report. 3 man survey crew - 2 x 1/2 day. Licensed surveyor report.

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		Dermal Cover	n/a
Acres		0.71	AC
Length		249	FT
Width		124	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	50	n/a
Horizontal Projection of Side Slope	31	62	FT
Horizontal Projection of Top Slope	31	0	FT
Dermal Cover			
Secondary Parameters			
Top Cover Type	Vegetation	Vegetation	n/a
Soil Cover Thickness	6	6	IN
Soil Cover Borrow Source	Off-site	Off-site	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a

Comments: Grade LFU-3 area to a minimum 1.5% slope. Use combination of import fill and on-Site material to achieve slope.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **GRADE AROUND LFU-3 TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND LFU-3 TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around LFU-3 soil cover to promote drainage into constructed storm drain channels to the east and south.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		70,534	$
Percentage	20	20	%
Dollar Amount		14,107	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		10	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-3 soil cover construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Drainage Channels
Description: The concrete lined drainage channel which partially overlays LFU-3, will be reconstructed post-remediation.
The E-W LFU-3 drainage channel will also be reconstructed south of its original location.

Approach: Ex Situ
Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
N-S DRAINAGE CHANNEL REPAIR	Yes	20	80
E-W DITCH CONSTRUCTION	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $51,820

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **N-S DRAINAGE CHANNEL REPAIR**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		N-S DRAINAGE CHANNEL REPAIR	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Repair/re-seal portions of north-south, concrete drainage channel. Assume half of surface area needs to be re-sealed with concrete lining.

Technology Name: **User Defined Estimate (# 2)**
User Name: **E-W DITCH CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		E-W DITCH CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Construction of new east-west drainage ditch at LFU-3, south of its original location. Assume 260 feet needed. This drainage ditch currently drains the Raptor Center and vicinity. It will discharge into the larger N-S concrete lined drainage ditch.

Technology Name: **User Defined Estimate (# 3)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage channels. 2 x 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Off-Site Transportation and Disposal
Description: Transport and dispose of RCRA hazardous, mixed waste, Non-RCRA hazardous, LLRW, and non-hazardous waste material generated by Site remedial excavations. Hazardous wastes will be transported to Class I hazardous waste facility; solid LLRW and mixed waste to LLRW accepting facility; and non-hazardous materials at Class II non-hazardous landfill. Assume drummed PTW will be sent to the LLRW accepting facility, and biological waste will be incinerated.

Approach: Ex Situ
Start Date: September, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0

Total Marked-up Cost: $2,291,553

Technologies:

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Non-leaking Drums	n/a
Quantity of Non-Leaking Drums		10	Drums
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dipose of drums containing PTW requiring stabilization. Assume default acceptance and treatment fee. Assume 594 mile transport distance.

Technology Name: **Off-site Transportation and Waste Disposal (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Low-Level Radioactive Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		1,322	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose LLRW. Assume $1,080/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Mixed Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		69	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose mixed waste. Assume $2,814/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		692	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose RCRA hazardous waste. Assume $170/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		276	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose non-RCRA hazardous waste. Assume $85/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Storm Drainage
Description: Install storm drainage controls for the lined and capped CAMU. Drainage piping will be added to the perimeter of the CAMU which will discharge runoff into a detention basin. The detention basin will discharge to either the LFU-1 discharge point or the LFU-3 north-south concrete lined drainage channel depending on the basin's location.

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY	Yes	5	95
STORM WATER DETENTION BASIN	Yes	20	80
Excavation	Yes	5	95
STORM WATER DETENTION BASIN	Yes	20	80
Excavation	Yes	5	95

Total Marked-up Cost: $691,009

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage control system. 1/2 day. Registered surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **STORM WATER DETENTION BASIN**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		STORM WATER DETENTION BASIN	n/a
WBS Type		HTRW	n/a
Selected WBS		331.09.07	n/a
Safety Level		D	n/a

Comments: Install detention basin to receive runoff from the LFU-1 and LFU-2/ET/WBH capped CAMUs.

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,650	CY
Depth		9	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	69	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate detention basin serving LFU-1 and LFU-2/ET/WBH CAMUs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **STORM WATER DETENTION BASIN**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		STORM WATER DETENTION BASIN	n/a
WBS Type		HTRW	n/a
Selected WBS		331.09.07	n/a
Safety Level		D	n/a

Comments: Install detention basin to receive runoff from the LFU-3 capped CAMU.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		444	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	31	81	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate detention basin at LFU-3.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Channel
Description: Install a north-south trending unlined storm drainage channel in LFU-1 drainage area (assume 380 ft).

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LFU-1 DRAINAGE CHANNEL	Yes	100	0
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $29,823

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LFU-1 DRAINAGE CHANNEL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LFU-1 DRAINAGE CHANNEL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: North-south trending concrete-lined storm drainage channel will be constructed to east of X-buildings.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage improvements. 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Install New GW Monitoring Wells
Description: Install, develop, and survey new groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Groundwater Monitoring Well	Yes	40	60
Residual Waste Management	Yes	80	20
LAND SURVEY	Yes	5	95
Professional Labor Management	Yes	80	20
WELL DEVELOPMENT	Yes	40	60
EXTEND GW MONITORING WELLS	Yes	100	0

Total Marked-up Cost: $118,168

Technologies:

Estimate Documentation Report

Technology Name: **Groundwater Monitoring Well (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Aquifers		One	n/a
Include Guard Posts		No	n/a
Depth to Groundwater to Aquifer One		50	FT
Number of Wells to Aquifer One		9	EA
Safety Level		D	n/a
Aquifer One			
Required Parameters			
Aquifer One: Average Well Depth		70	LF
Aquifer One: Formation Type		Unconsolidated	n/a
Aquifer One: Drilling Method		Hollow Stem	n/a
Aquifer One: Well Diameter		2 Inch	n/a
Aquifer One: Well Construction Material		PVC Schedule 80	n/a
Aquifer One: Split Spoon Sample Collection		Yes	n/a
Aquifer One: Average Number of Soil Samples per Well		0	EA
Aquifer One: Soil Analytical Template		None	n/a
Aquifer One: Safety Level		D	n/a

Comments: Install new wells according to Table 5-3.

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		9	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey newly installed groundwater monitoring wells. Registered surveyor report. 0.5 day

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		101,560	$
Percentage	19.9	5	%
Dollar Amount		5,078	$

Comments:

Technology Name: **User Defined Estimate (# 2)**
User Name: **WELL DEVELOPMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WELL DEVELOPMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.01	n/a
Safety Level		D	n/a

Comments: Rent equipment for well develoment for 1 week. One equipment operator and one supervising engineer/geologist.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **EXTEND GW MONITORING WELLS**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXTEND GW MONITORING WELLS	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.04	n/a
Safety Level		D	n/a

Comments: Extend wells UCD1-008, UCD1-013, and UCD2-014 to new level of ground surface.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Groundwater and Storm Water Monitoring
Description: Groundwater monitoring at Site wells and storm water monitoring for lifetime of alternative until cleanup objectives are met. Sample collection, analysis, data validation, data import and monitoring reports.

Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
MONITORING	Yes	100	0

Total Marked-up Cost: $4,198,648

Technologies:

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		MONITORING	n/a
Groundwater		Yes	n/a
Surface Soil		No	n/a
Surface Water		Yes	n/a
Subsurface Soil		No	n/a
Sediment		No	n/a
Soil Gas		No	n/a
Air		No	n/a
Site Distance (One-way)		70	MI
Safety Level		D	n/a
Groundwater			
Required Parameters			
Average Sample Depth		50	FT
Samples per Event (First Year)		19	n/a
Samples per Event (Out Years)		19	n/a
Number of Events (First Year)		4	n/a
Number of Events (Out Years)		1	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	System Water - Low Level Radioactive	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Sampling Method	Existing Wells - Low Flow Pump	Existing Wells - Low Flow Pump	n/a
Number of Wells/Day	8	8	EA
Contain Purge Water	Yes	Yes	n/a
Surface Water			
Required Parameters			
Average Sample Depth		0	FT

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
Surface Water			
Required Parameters			
Samples per Event (First Year)		3	n/a
Samples per Event (Out Years)		3	n/a
Number of Events (First Year)		2	n/a
Number of Events (Out Years)		2	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	None	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Number of Samples/Day	8	8	EA
QA/QC			
Secondary Parameters			
Split Samples	1: 10	1: 10	EA
Field Duplicate Samples	1: 10	1: 10	EA
Rinse Blanks (per Round)	1	1	EA
Trip Blanks (per Day)	1	1	EA
Matrix Spikes/Matrix Spike Duplicates	1: 20	1: 20	EA
Data Management			
Secondary Parameters			
Monitoring Plan	Standard	Standard	n/a
Lab Data Review	Stage 2b	Stage 2b	n/a
Submit Data Electronically	Yes	Yes	n/a
Monitoring Reports	Standard	Abbreviated	n/a

Comments: Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the land disposal units according to Table 5-3. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, Semivolatile organic compounds (1,4-dioxane by single ion monitoring) Cam 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. The total groundwater and stormwater monitoring period will continue until remedial action objectives are achieved.

continue until remedial action objectives are achieved.
Includes data validation, electronic data import, data management and monitoring reports.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M Drainage System
Description: Annual O&M of constructed storm water drainage control infrastructure.

Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	No	0	0

Total Marked-up Cost: $6,000

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	n/a
WBS Type		HTRW	n/a
Selected WBS		342.05.08	n/a
Safety Level		D	n/a

Comments: Assume annual maintenance costs of $6,000/year for lifetime of drainage system. Includes lined/capped CAMU detention basin, LFU-1 drainage swale, LFU-3 drainage channels. Present value cost for annual O&M of drainage channels. (Cost for this element expressed as annual cost only)

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M of Graded Areas
Description: Operations and maintenance of evapotranspiration capped areas.

Start Date: August, 2012
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Operations and Maintenance	Yes	40	60

Total Marked-up Cost: $606,260

Technologies:

Technology Name: **Operations and Maintenance**

Description	*Default*	*Value*	*UOM*
Labor			
Secondary Parameters			
Operations Labor: Type	Exclude from Estimate	Minimum	n/a
Professional Labor: Type	Exclude from Estimate	Minimum	n/a

Comments: Inspect, survey and repair CAMU cap for lifetime of alternative. Assumes some erosion and settlement, but no large scale failure.

Estimate Documentation Report

Technology Name: **Capping (# 1) - (O&M Parameters)**

Description	*Default*	*Value*	*UOM*
O&M Parameters			
Type of Cap		Dermal Cover	n/a
Acres		6	AC
Top Cover Type		Vegetation	n/a

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Five-Year Reviews
Description: Five-Year Reviews for all technologies and controls implemented.

Start Date: March, 2015
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Five-Year Review	Yes	100	0

Total Marked-up Cost: $159,250

Technologies:

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Site Complexity		Low	n/a
Document Review		Yes	n/a
Interviews		Yes	n/a
Site Inspection		Yes	n/a
Report		Yes	n/a
Travel		No	n/a
Rebound Study		No	n/a
Start Date		March-2015	n/a
No. Reviews		6	EA
Document Review			
Required Parameters			
5-Year Review Check List		Yes	n/a
Record of Decision		Yes	n/a
Remedial Action Design & Construction		Yes	n/a
Close-Out Report		Yes	n/a
Operations & Maintenance Manuals & Reports		Yes	n/a
Consent Decree or Settlement Records		Yes	n/a
Groundwater Monitoring & Reports		Yes	n/a
Remedial Action Required		Yes	n/a
Previous 5-Year Review Reports		Yes	n/a
Interviews			
Required Parameters			
Current and Previous Staff Management		Yes	n/a
Community Groups		Yes	n/a
State Contacts		Yes	n/a
Local Government Contacts		Yes	n/a
Operations & Maintenance Contractors		Yes	n/a
PRPs		Yes	n/a
Remedial Design Consultant		Yes	n/a
Site Inspection			
Required Parameters			

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
Site Inspection			
Required Parameters			
General Site Inspection		Yes	n/a
Containment System Inspection		Yes	n/a
Monitoring Systems Inspection		Yes	n/a
Treatment Systems Inspection		Yes	n/a
Regulatory Compliance		Yes	n/a
Site Visit Documentation (Photos, Diagrams, etc.)		Yes	n/a
Report			
Required Parameters			
Introduction		Yes	n/a
Remedial Objectives		Yes	n/a
ARARs Review		Yes	n/a
Summary of Site Visit		Yes	n/a
Areas of Non Compliance		Yes	n/a
Technology Recommendations		Yes	n/a
Statement of Protectiveness		Yes	n/a
Next Review		Yes	n/a
Implementation Requirements		Yes	n/a

Comments: Inspect landfill areas for performance issues such as erosion or excessive settlement. Review and update all documents associated with compliance, performance, land use controls, and monitoring results. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews every five years for the lifetime of the alternative.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Periodic Storm Water Lift Station Repair
Description: Periodic costs associated with storm water lift station every ten years.

Start Date: August, 2020
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LIFT STATION PUMP REPLACEMENT	Yes	100	0

Total Marked-up Cost: $4,012

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LIFT STATION PUMP REPLACEMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LIFT STATION PUMP REPLACEMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		342.03.90	n/a
Safety Level		D	n/a

Comments: RACER assembly 33410101 Pump & Motor Cost = $892.37 x 3 lift stations. Assume cost incurred every ten years. Express cost as the one-time payment cost (in base year dollars). Present value over time cost is calculated outside of RACER.

ATTACHMENT F-3c

ALTERNATIVE SW-3 ASSEMBLY LEVEL REPORT

See file in Appendix F Folder titled 'Attachment_F-3c_SW-3_AssemblyLevelReport.xlsx'

ATTACHMENT F-4a

ALTERNATIVE SW-4 COST ASSUMPTIONS

ALTERNATIVE SW-4 COST ASSUMPTIONS

Attachment F-4a-1. Alternative SW-4 Description

Attachment F-4a-2. Planning and Oversight

Attachment F-4a-3. Biological Survey and Elderberry Shrub Cluster Relocation

Attachment F-4a-4. Data Gaps Investigation of the Southern Trenches and Hopland Field Station Disposal Area

Attachment F-4a-5. Decontamination Facilities

Attachment F-4a-6. Building Decommissioning and Demolition, Building Sampling and Analysis

Attachment F-4a-7. Building Decommissioning and Demolition, Building Demolition and Reconstruction

Attachment F-4a-8. Groundwater Monitoring Well Decommissioning

Attachment F-4a-9. Clearing and Grubbing

Attachment F-4a-10. Demolish/Backfill LFU-3 Drainage Channels

Attachment F-4a-11. Excavation of ET Known PTW and Exploratory Trenches

Attachment F-4a-12. Excavation of LFU-1 Known PTW and Exploratory Trenches

Attachment F-4a-13. Excavation of LFU-2 Known PTW and Exploratory Trenches

Attachment F-4a-14. Excavation of LFU-3 Exploratory Trenches

Attachment F-4a-15. Excavation of ET VOC “Hot Spot”

Attachment F-4a-16. Excavation of LFU-1 Drainage Area

Attachment F-4a-17. Excavation of LFU-2 VOC “Hot Spot”

Attachment F-4a-18. Excavation of LFU-3 Drainage Area

Attachment F-4a-19. Materials Management

Attachment F-4a-20. Excavated Materials Consolidation

Attachment F-4a-21. Off-Site Transportation and Disposal

Attachment F-4a-22. Install LFU-1 Evapotranspiration Cap

Attachment F-4a-23. Install LFU-2/ET/WBH Evapotranspiration Cap

Attachment F-4a-24. Install LFU-3 Evapotranspiration Cap

Attachment F-4a-25. Install New Groundwater Monitoring Wells

Attachment F-4a-26. Storm Drainage Controls

Attachment F-4a-27. O&M: Institutional Controls

Attachment F-4a-28. O&M: Groundwater and Storm Water Monitoring

Attachment F-4a-29. O&M of Storm Water Drainage Infrastructure

Attachment F-4a-30. O&M of Evapotranspiration Caps

Attachment F-4a-31. Periodic Costs: Five Year Reviews

Attachment F-4a-32. Contingent Action: Install ST and HSFDA Evapotranspiration Cap

Attachment F-4a-1. Alternative SW-4 Description - Cost Estimates, UC Davis LEHR/OCL

Alternative SW-4. VOC "Hot Spot" Removal, Three On-Site Corrective Action Management Units with Evapotranspiration Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring

— See Section 5 of the FS - Volume 1 for a description of this alternative.

Alternative SW-4 Components Listed:

- Planning and oversight
- Biological Survey
- Elderberry Shrub Cluster Relocation
- Data Gap Investigation
- Decontamination Facilities
- Building Decommissioning and Demolition
  - Building Sampling
  - Building Demolition and Reconstruction
- Groundwater Well Decommissioning
- Clearing and Grubbing
- Demolish/Backfill LFU-3 Drainage Channels
- Excavation of ET Known PTW and Exploratory Trenches
- Excavation of LFU-1 Known PTW and Exploratory Trenches
- Excavation of LFU-2 Known PTW and Exploratory Trenches
- Excavation of LFU-3 Known PTW and Exploratory Trenches
- ET VOC "Hot Spot," East and West Excavation
- LFU-1 Drainage Area Excavation
- LFU-2 VOC "Hot Spot" Excavation
- LFU-3 Drainage Area Excavation
- Materials Management
- Excavated Materials Consolidation
- Off-Site Transportation and Disposal
- Install LFU-1 Evapotranspiration Cap
- Install LFU-2/ET/WBH Evapotranspiration Cap
- Install LFU-3 Evapotranspiration Cap
- Install New Groundwater Wells
- Storm Drainage Controls
  - Storm Water Collection and Conveyance System
  - Installation of extended detention basins
  - Installation of vegetated swale along eastern edge of LFU-1
  - Redirect drainage ditch south along perimeter of LFU-3
  - Reconstruct LFU-3 north-south drainage channel
- Operations and Maintenance (O&M): Institutional Controls
- O&M: Groundwater and Storm Water Monitoring
- O&M of Storm Water Drainage Infrastructure
- O&M of Caps
- Periodic Costs: Storm Water Lift Station Repair (See O&M of Storm Water Drainage Infrastructure)
- Periodic Costs: Five Year Reviews
- Contingent Action: Install ST and HFSDA Evapotranspiration Cap

Planning and Oversight

Work planning, Health and Safety, Construction Quality Assurance/Quality Control Program, Construction Site Environmental Controls, Materials Management Plan (Table 5-1)

Costs for most planning and oversight are included in RACER's "Professional Labor Management" cost sub-component and in professional labor cost assemblies.
These planning and oversight activities include:

Preparation and submittal of Contract-Required Deliverables
Preparation and submittal of project-specific planning documents (Work Plan, HASP, QAPP, materials management plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Sampling and Construction Quality Control Test Results
Health & Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Costs are estimated as a percentage of the calculated marked-up cost for a given remedial action component through "Professional Labor Management," or through professional labor assemblies included in the estimate for the remedial action cost component.

"Professional Labor Management" includes the costs of typical professional support activities associated with construction including preparation of site-specific construction activities, incidental permit acquisition, and contract-required deliverables. It also includes typical site-specific professional support activities associated with remedial action including evaluation of sampling and analysis data, comparison of results with project goals, coordination of field activities, and documentation and reporting of field activities. Each cost component has planning and oversight costs associated with it; where professional labor management is not specifically included as a cost sub-component, it is assumed that such cost estimates contain professional labor hours bundled with the cost for implementation of that cost component.

Attachment F-4a-3. Biological Survey and Elderberry Shrub Cluster Relocation - Cost Estimates, UC Davis LEHR/OCL

Biological Survey

Conduct a biological survey assessing selected plant, insect and animal species abundance, assess biotic diversity, and survey endangered/critical species' habitat.

Present findings in an biological survey report.

Elderberry Shrub Cluster Relocation

Elderberry shrub clusters located within areas potentially impacted by remediation will be relocated to the Russell Ranch Mitigation Area, as specified in the UC Davis Long Range Development Plan EIR Mitigation Measure 4.4-6(b).

Assume cost is $270,000 based on previous relocations.

Attachment F-4a-4. Data Gaps Investigation of the Southern Trenches and Hopland Field Station Disposal Area - Cost Estimates, UC Davis LEHR/OCL

Description:

Pre-remedial action characterization study to be conducted in the ST and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two sample per ten-foot length of the trench plus two end-sidewall samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Assumptions:

Southern Trenches

Total Number of Exploratory Trenches	5	
Depth	6	ft
Number of Samples	80	
Analytes:	Ra-226, Ra-228, Sr-90, Cs-137, isotopic uranium, tritium, and C-14	

Hopland Field Station Disposal Area (HFSDA)

Total Number of Exploratory Trenches	3	
Depth	6	ft
Number of Samples	21	
Analytes:	Ra-226, Ra-228, Sr-90, Cs-137, isotopic uranium, tritium, and C-14	

Survey Exploratory Trenches

Three man crew to survey investigation trenches. Registered surveyor report. Assume surveying completed in one day after completion of investigation.

Attachment F-4a-5. Decontamination Facilities - Cost Estimates, UC Davis LEHR/OCL

Decontamination facilities for equipment and personnel during duration of remedial excavation. Include washout for decontamination of trucks leaving Site. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 36 weeks.

Equipment Decontamination Operation Length	36	weeks
(Assume construction will occur over nine months of the year)		
Average crew size	10	
Shifts	1	per day
Safety Level	Level D	

Prior to implementation of the alternatives, nine Site buildings will be demolished and hazardous waste will be disposed off-Site. Non-hazardous material will be recycled, re-used, or disposed in an on-Site CAMU. It is assumed the buildings are contaminated with asbestos, lead, and PCBs. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated. Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. Assume 1 sample per 300 ft² of building surfaces. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals.

Total Building Surface Area	43,287	ft²
Number of samples	141	(see backup work below)
Sampling rate	75	samples/day
Crew Size	3	2 radiation technicians + 1 Health and Safety Officer

Analytical:	TCLP (RCRA) (EPA 1311)	H-292 and H-293 will also include:
	Testing, TAL metals (6010/7000s)	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total
	Pesticides/PCBs (SW 3550B/SW 8081/8082)	Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic
	Asbestos in Bulk Solids/Soils (Identification by PLM)	Testing, rad analytical vegetation/sediment/soil, gross alpha, total gas flow proportional counting

Two (2) Geriatrics Buildings (H-292 and H-293)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building Surface Area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
100	53	5,285	10	5	walls	3,182	265	10	10
					roof	5,305	442	16	6
					floor	5,285	5,285	196	6
					other building materials (assume 5% of building structure)	---	300	11	9
					Total	13,772	6,292	233	31

Five (5) Vacant Animal Housing Buildings (H-231,-232,-234,-236,-237)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
25	20	500	10	5	walls	917	382	14	4
					roof	502	42	2	1
					floor	500	500	19	1
					other building materials (assume 5% of building structure)		46	2	4
					Total	1,919	970	36	10

Storage Building at West Side of Landfill No. 3 (H-253)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
40	30	1,200	10	5	walls	1,439	120	4	6
					roof	1,205	100	4	4
					floor	1,200	1,200	44	4
					other building materials (assume 5% of building structure)		71	3	5
					Total	3,844	1,491	55	19

Co-60 Annex (H-290)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
30	21	630	10	5	walls	1,039	87	3	4
					roof	632	53	2	1
					floor	630	630	23	1
					other building materials (assume 5% of building structure)		38	1	4
					Total	2,302	808	30	10
					Grand Total (all buildings)	43,287	19,734	731	141

Demolish and dispose buildings that must be removed to implement remedial action. Assume buildings are contaminated with asbestos, lead, and PCBs. Non-hazardous demolition waste will be disposed of in the on-Site CAMUs; hazardous waste will be sent off-Site for disposal.

Building

1

Demolish, dispose Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

2

Demolish, dispose Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

3

Demolish, dispose Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

4

Demolish, dispose Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

5

Demolish, dispose Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

6

Demolish, dispose Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²
Type of Building	concrete	
Number of stories	1	
Percent Hazardous Material	5%	
Height	12	ft

Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

7

Demolish, dispose Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

8

Demolish, dispose storage building near northwest corner of Landfill No. 3 (H-253). Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	1,200	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	64	CY	
Volume Hazardous	3	CY	
Safety Level	Level D		

9 Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	630	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	33	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

Note: A new building will be constructed to replace buildings H-253 and H-290. The replacement is assumed to be 1,830 square feet.

Total Volume of Non-Hazardous Building Demolition Waste to Dispose of Off-Site

0 CY

Total Volume of Hazardous Building Demolition Waste to Dispose of Off-Site

45 CY

Building Reconstruction Costs

Three warehouse buildings will be constructed. Two will be replacements for the Geriatrics buildings, H-292 and H-293, the third is to replace buildings, H-253 and H-290. Cost estimates are based on phone conversation with representative from Allied Steel (12/20/2010) and estimates from Rex Moore Electrical Contractors (12/22/2010) and J.W. McClenahan Company plumbing contractors (1/3/2011). Estimates include engineering, design, and construction. 20% contingency to be added to account for additional cost elements.

1,830 SF warehouse:

Building design and construction (with concrete foundation): $30,000	Dimensions: 35’ x 55’ x 10’	Distance to drinking water main = 50 feet
Electrical: $16,031	1 restroom (toilet + sink)	Distance to sanitary sewer = 200 feet
Plumbing: $18,000	1 industrial sink	Distance to electrical distribution = 100 feet
Estimated Cost = $34.99/SF		

5,285 SF warehouse:

Building design and construction (with concrete foundation): $70,000	Dimensions: 53’ x 100’ x 10’	Distance to drinking water main = 50 feet
Electrical: $27,214	1 restroom (toilet + sink)	Distance to gas = 100 feet
Plumbing: $47,250	2 industrial sinks	Distance to sanitary sewer = 300 feet
Estimated Cost = $27.34/SF	natural gas connection	

Decommission the following wells (Table 5-3):

Well	Total Boring Depth (ft bgs)	Well Diameter (inches)	Well Screen Type
DDC-1*	85.5	15	PVC
DDC-2*	80	15	PVC
DDC-3*	80	15	PVC
TP-1*	80	15	PVC
TP-2*	79	12.25	PVC
TP-3*	80.5	12.25	PVC
TP-4*	80.5	12.25	PVC
TP-5*	80	12.25	PVC
UCD1-008	56	2	PVC
UCD1-009	51.5	2	PVC
UCD1-012	65	4	PVC
UCD1-013	65	4	PVC
UCD1-050	69.5	4	Stainless Steel
UCD1-051	70	4	Stainless Steel
UCD2-014	86	4	PVC

* If nested well, value is the borehole diameter.

Attachment F-4a-9. Clearing and Grubbing - Cost Estimates, UC Davis LEHR/OCL

Clear and Grub	Clear all trees and vegetation within footprint of excavation/cap. Used current satellite photo and photographs from recent field activities to estimate amount of vegetation to clear. Assumed all removed material will be stored on-Site for re-use.	
LFU-1	Disposal	on-site, chipped
	ACRES	2.4 AC
	FLORA DENSITY	light; 5 trees per acre
LFU-2/ET/WBH	Disposal	on-site, chipped
	ACRES	3.5 AC
	FLORA DENSITY	light; 15 trees per acre
LFU-3	Disposal	on-site, chipped
	ACRES	1.0 AC
	FLORA DENSITY	light; 10 trees per acre

Attachment F-4a-10. Demolish/Backfill LFU-3 Drainage Channels - Cost Estimates, UC Davis LEHR/OCL

Description:

Demolish a portion of the LFU-3 N-S concrete-lined drainage channel along eastern boundary of LFU-3 where waste is underlying and needs to be excavated. Much of the existing channel can be left in place. The drainage area will be re-constructed in its original location post-remediation.

The E-W drainage will be backfilled and will be re-constructed post-remediation south of the LFU-3 capped area.

Major Assumptions:

Estimate the volume of concrete to be removed in demolition of Landfill Unit No. 3 N-S drainage channel:

Length (total)	270	ft
Length (portion to be demolished)	160	ft
Top Width of channel	30	ft
Bottom Width of channel	16	ft
Depth	7	ft
Thickness of concrete	0.2	ft
Length of side wall	9.9	ft
Volume of channel concrete to remove	964	ft^3
	36	CY

Estimated backfill for the current E-W channel in the footprint of the proposed cap:

Length	100	ft	
Top Width of channel	9	ft	
Bottom Width of channel	3	ft	
Depth	3	ft	
Volume to backfill:	2,700	ft^3	
	100	CY	convert to CY
	140	**CY**	**bulk factor applied**

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in the ET. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate Exploratory Trenches

ET Trench 24			
Volume		21	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET Trench 26			
Volume		12	BCY
Avg. Depth		7	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET TRL-45			
Volume		61	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET TRL-48			
Volume		57	BCY
Avg. Depth		10	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET-T1			
Volume		18	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	5	
ET-T2.			
Volume		21	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	6	
ET-T3			
Volume		21	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	6	
ET-T4			
Volume		21	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	6	
Total Volume Excavated		324	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	324	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in LFU-1. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate Exploratory Trenches

LFU-1 TRL-35			
Volume		137	BCY
Avg. Depth		7	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-1 TRL-36			
Volume		55	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU1-T1			
Volume		38	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T2			
Volume		40	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T3			
Volume		41	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T4			
Volume		57	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	10	
LFU1-T5			
Volume		69	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	11	
LFU1-T6			
Volume		83	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	13	
LFU1-T7			
Volume		80	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	13	
Total Volume Excavated		838	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level D	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	838	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in LFU-2. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate Exploratory Trenches

LFU-2 TRL-12			
Volume		11	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-2 TRL-22			
Volume		48	BCY
Avg. Depth		15	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-2 TRL-20			
Volume		11	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU2-T1			
Volume		174	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	19	
LFU2-T2			
Volume		174	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	19	
LFU2-T3			
Volume		132	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	15	
LFU2-T4			
Volume		132	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	15	
Total Volume Excavated		953	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	953	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate proposed exploratory trenches in LFU-3. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate Exploratory Trenches

LFU3-T1			
Volume		40	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU3-T2			
Volume		44	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	8	
Total Volume Excavated		117	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level D	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	117	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-4a-15. Excavation of ET VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate ET VOC "Hot Spot," east and west to depth of 20 feet bgs.

Dispose of excavated hazardous material off-Site. For ET VOC "Hot Spot," west backfill and compact with non-hazardous excavated material. For ET VOC "Hot Spot," east backfill and compact with clear fill.

Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET VOC "Hot Spot," East

Volume		713	BCY
Avg. Depth		20	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		998	LCY
Safety Level		Level C	

Excavate ET VOC "Hot Spot," West

Volume		492	BCY
Avg. Depth		20	FT
Source of backfill	On-Site		
Number of confirmation samples	None, excavated area part of capped CAMU		
Percent to be used as backfill (on-Site)		100	%
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,686	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of ET VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-4a-16. Excavation of LFU-1 Drainage Area - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-1 Drainage Area to ten feet bgs. Backfill with clean fill.

Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-1 Drainage Area

Volume	7,215	BCY
Avg. Depth	10	FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Analytical		
Testing, TAL metals (6010/7000s)	283.50	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
Testing, purgeable organics (624, 8260)	138.95	$/sample
Testing, semi-volatile organics (625, 8270)	465.84	$/sample
Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Off-Site Backfill Required	10,100	LCY
Safety Level	Level D	

Load and Haul

Volume	10,100	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Land Survey of Excavation

Survey boundaries of Landfill Unit No. 1 Drainage Area excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-4a-17. Excavation of LFU-2 VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-2 VOC "Hot Spot" to depth of 20 feet bgs. Backfill non-hazardous material in excavation.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate LFU-2 VOC "Hot Spot"

Volume		1,210 BCY
Avg. Depth		20 FT
Source of backfill	On-Site	
Number of confirmation samples	None, excavated area part of capped CAMU	
Percent to be used as backfill (On-Site)		100 %
Off-Site Backfill Required		0 LCY
Safety Level		Level C

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,693 LCY
One Way Haul Distance	500 FT

Land Survey of Excavation

Survey boundaries of LFU-2 VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-4a-18. Excavation of LFU-3 Drainage Area - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-3 Drainage Area to ten feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-3 Drainage Area:

Volume		2,742 BCY
Avg. Depth		10 FT
Source of backfill	25 mile distance off-Site	3,839 LCY
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Number of composites	default	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		3,839 LCY
Safety Level		Level D

Load and Haul

Volume	3,839 LCY
One Way Haul Distance	500 FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Land Survey of Excavation

Survey boundaries of excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency

radiological work	15 %

Materials management includes activities related to the management of excavated soil and solid waste (i.e., stockpiling, sifting/sorting, waste characterization, and staging prior to final disposal).

Bulk Material Storage

Accommodate total excavated volume (TEV) across all subareas to allow for sorting, waste characterization, and staging. Stockpile excavated material in bermed, covered storage area. Safety Level D.

TEV (from subareas excavated under this alternative)	19,882	LCY

Sifting of Excavated Material

Assume rate of sifting = 200 CY/day

Assume the use of similar equipment used under the MEC Sifting assembly. Material will be segregated into PTW, biological waste, and LTW waste streams. Safety Level C.

Soil/solid waste volume (PTW, biological waste, and LTW waste streams):	11,800	LCY
Trommel Screener	3	month
Grizzly Shaker Unit	3	month
Conveyors,	1	unit
Refuse Bottom Hopper	1	unit
5'x16' Double tray Vibrating Screening Unit	1	unit
Two full-time equipment operators, oilers (per screening operation)	986	hrs

Loader for Staging Area

One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled material needs to be moved. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

950, 3.0 CY, Wheel Loader (active)	300	hours
950, 3.0 CY, Wheel Loader (standby)	300	hours
Bobcat with Backhoe	3	month
All Terrain Forklift (Monthly Rental)	3	month

Waste Characterization

Assume the included materials and analyses for waste characterization prior to final disposal of excavated materials. Assume 1 sample per 300 CY for costing assumptions, sampling frequency may increase during remedial action.

Material to be characterized:	PTW + VOC "Hot Spot" TEV	
Total Volume	3,515	LCY
Sampling rate	1	sample/300 CY (or 1 sample per container)
Number of samples	12	
Analytical suite:		
Testing, TAL metals (6010/7000s)	257.73	$/sample
TCLP (RCRA) (EPA 1311), Soil Analysis	120.30	$/sample
Testing, soil & sediment analysis, BTEX/gasoline hydrocarbons mod EPA 8020 (PID/FIFD)	107.37	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	234.37	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	278.01	$/sample
Purgeable organics (624, 8260)	126.31	$/sample
Testing, semi-volatile organics, pkd. column (8250)	416.14	$/sample
Testing, paint filter liquids test (9095)	27.90	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, ignitibility (1010)	31.64	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, corrosivity (1110, NACE)	26.04	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, reactivity (cyanide/sulfide)	72.65	$/sample
Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic	133.34	$/sample
Testing, rad analytical, additional services, characterization of any unknown rad sample (low level)	194.36	$/sample

Drum Staging

Drums for PTW laboratory waste (lab pack) disposal. Includes characterization of wastes in drums. Assume number of drums = volume of PTW in LCY divided by four. Safety Level C.

Total PTW	150	LCY
Store PTW in bulk container	6	containers (30 CY capacity)
Number of drums	38	drums
Percentage Full	65	%
Temporary Storage Area	438	ft^2
Overpacks	85 gal. steel salvage drum	
Waste characterization	1 sample per drum, liquid waste characterization template	

Attachment F-4a-20. Excavated Materials Consolidation - Cost Estimates, UC Davis LEHR/OCL

CAMU	Volume to Consolidate [LCY]
LFU-1 CAMU	5,153
LFU-2 CAMU	5,153
LFU-3 CAMU	3,003

Attachment F-4a-21. Off-Site Transportation and Disposal - Cost Estimates, UC Davis LEHR/OCL

	LLRW (LCY)	**Mixed Waste** (LCY)	**RCRA Hazardous** (LCY)	**Non-RCRA Hazardous** (LCY)	**Non-Hazardous** (LCY)	**Building Hazardous** (LCY)	**Building Non-Hazardous** (LCY)	**Drums/Lab Pack** (number of drums)
Distance to disposal facility	594 miles	594 miles	227 miles	227 miles	93 miles	227 miles	93 miles	594 miles
Volume*	1,339	75	781	276	0	45	0	
Volume for Incineration**	0	0	0	0	0	0	0	
Final Disposal Volumes	**1,339**	**75**	**781**	**276**	**0**	**45**	**0**	**38**

* See Table E-13 (Appendix E, FS - Volume 1).
** Biological waste only.

Attachment F-4a-22. Install LFU-1 Evapotranspiration Cap - Cost Estimates, UC Davis LEHR/OCL

Description: Install LFU-1 evapotranspiration cap, vegetate with native grasses to promote evapotranspiration.

Major Assumptions:

Area: 2.0 acres

Cap layers: topsoil cover
clay loam layer
foundation layer

Capacity of CAMU to receive waste above current grade and underneath cap:
8,356 CY

Volume to compact (above grade and underneath cap):
5,153 LCY

Survey:

Survey crew to delineate boundaries of graded land disposal unit and ensure proper slope. Licensed surveyor report. 3 man survey crew - 2 x 1/2 day. Licensed surveyor report.

Attachment F-4a-23. Install LFU-2/ET/WBH Evapotranspiration Cap - Cost Estimates, UC Davis LEHR/OCL

Description: Install LFU-2/ET/WBH evapotranspiration cap, vegetate with native grasses to promote evapotranspiration.

Major Assumptions:

Area: 3.5 acres

Cap layers: topsoil cover
clay loam layer
foundation layer

Capacity of CAMU to receive waste on top of current grade and underneath cap:
14,758 CY

Volume to compact (above grade and underneath cap):
5,153 LCY

Survey:

Survey crew to delineate boundaries of graded land disposal unit and ensure proper slope. Licensed surveyor report. 3 man survey crew - 2 half-days. Licensed surveyor report.

Attachment F-4a-24. Install LFU-3 Evapotranspiration Cap - Cost Estimates, UC Davis LEHR/OCL

Description:

Install LFU-3 evapotranspiration cap, vegetate with native grasses to promote evapotranspiration.

Major Assumptions:

Area: 0.71 acres

Cap layers: topsoil cover
clay loam layer
foundation layer

Capacity of CAMU to receive waste on top of current grade and underneath cap:
3,003 CY

Volume to compact (above grade and underneath cap):
3,003 LCY

Excavated Material to add to capped area:

Use material excavated during construction of re-routed east-west LFU-3 drainage channel (364 CY) to reduce import fill requirements (less material used to backfill original east-west channel, 140 CY).

Surveying of Cap:

Survey crew to delineate boundaries of graded land disposal unit and ensure proper slope. Licensed surveyor report. 3 man survey crew - 2 half-days. Licensed surveyor report.

Attachment F-4a-25. Install New Groundwater Wells - Cost Estimates, UC Davis LEHR/OCL

Groundwater Well Installation - Nine HSU-1 groundwater monitoring wells and one HSU-2 groundwater monitoring well would be installed. The wells and piezometers will have screen/sand pack intervals of seven feet or less to minimize their potential to act as vertical conduits for downward COC migration, and will be completed just below the bottom of the depth range of seasonal water table fluctuation. In addition, it is assumed that three density-driven convection (DDC) wells and three nested piezometers would be installed as replacements for those decommissioned in the ET North.

9 HSU-1 wells, 70 ft depth, 2" diameter, PVC Schedule 80
1 HSU-2 well, 105 ft depth, 4" diameter, PVC Schedule 80
3 DDC wells, 90 ft depth, 15" diameter borehole. Each DDC well assumed to include:
- Recirculating well: 90 ft depth, 4" diameter, PVC Schedule 80
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 30 ft depth
  - Intermediate: 52 ft depth
  - Deep: 76 ft depth
- Air Injection Tubing: 90 ft depth + 35 feet to blower, 1.25" diameter, PVC Schedule 80
- Vapor Return Line: 50 feet to discharge pipe, 2" diameter, PVC Schedule 80
- Acid Drip Line: 50 feet to acid storage, 0.75" diameter, PVC Schedule 80

3 Sets of Nested Piezometers, 80 ft depth, 15" diameter borehole. Each set of piezometers assumed to include:
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 35 ft depth
  - Intermediate: 53 ft depth
  - Deep: 80 ft depth

Dispose drill cuttings as non-hazardous waste
Survey and develop completed wells

LFU-1 Storm Drainage

North-south trending vegetated swale will be constructed to east of LFU-1 cap.

Lining:	soil/vegetation	
Length	400	feet
Erosion Controls - Geotextile	326	yd^2
Erosion Controls - Rip-rap	24	CY

LFU-3 N-S Drainage Channel

North-south trending concrete-lined drainage channel will be reconstructed to match original conditions.

Length	270	ft
Top Width	30	ft
Bottom Width	16	ft
Depth	7	ft
Length of north-south drainage channel to reconstruct	160	ft

LFU-3 E-W Drainage Ditch

Re-route the east-west vegetated drainage ditch to the south of LFU-3. Install new culvert to discharge into north-south, concrete-lined drainage channel.

Lining:	soil/vegetation	
Length	260	ft
Top Width	15	ft
Depth	3	ft
Erosion Controls - Geotextile	212	yd^2
Erosion Controls - Rip-rap	16	CY

LFU-1/LFU-2/ET/WBH Collection and Conveyance System, Lift Station and Extended Detention Basin

Size Basin					
(d) Depth	4	ft	Area HDPE liner	7,850	ft^2
(l) Length	85	ft			
(w_b) Bottom Width	20	ft			
(w_t)Top Width	45	ft			
(V) Volume	11,050	ft^3			
	409	CY			
Length of piping:					
to detention basin	2500	ft			
discharge from basin	630	ft			
Number of lift stations:	2		One north of LFU-2 to pump water to detention basin, one east of detention basin to pump toward discharge at LFU-1.		
Peak flow:	0.35	cfs			

LFU-3 Collection and Conveyance System, Lift Station and Extended Detention Basin

Size Basin					
(d) Depth	3	ft	Area HDPE liner	2,377	ft^2
(l) Length	40	ft			
(w_b) Bottom Width	3	ft			
(w_t)Top Width	20	ft			
(V) Volume	1,380	ft^3			
	51	CY			
Length of piping:					
to detention basin	920	ft			
discharge from basin	110	ft			
Number of lift stations:	1		On north side of LFU-3 to pump water to detention basin		
Peak flow:	0.35	cfs			

Survey :

Survey newly constructed drainage channels and detention basins. 2 half-days. Registered surveyor report.

Attachment F-4a-27. O&M: Institutional Controls - Cost Estimates, UC Davis LEHR/OCL

Survey Site to establish legal boundaries.
Implement and maintain institutional/land use controls.
Document landfill locations and prohibit Site development or activities incompatible with designated land use.

		# meetings	# people	# days	airfare	mileage to meeting site
Planning Documents	LUC Assurance Plan	2	2	1	0	70
	LUC Implementation Plan	2	2	1	0	70
	Construction Permitting	1	1	1	0	70
	Geographic Information Systems/Overlay Maps	1	1	1	0	70
Implementation	Deed Notification	1	unit			
	Restrictive Covenants	1	unit			
	Access Control Signs	22	unit	Assume one sign every 150 feet around perimeter of land disposal units		
	Utility Notification Service	1	unit			
	GIS/Overlay maps	1	unit			
Monitoring and Enforcement						
	Duration of monitoring/enforcement	100	YRS (or lifetime of alternative)			
	Reports & Certifications	1	per year			
	Site Visits/Inspections	1	per year			
Survey:	5 days, licensed surveyors' report					

Attachment F-4a-28. O&M: Groundwater and Storm Water Monitoring - Cost Estimates, UC Davis LEHR/OCL

Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the land disposal units according to Table 5-3. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, semivolatile organic compounds (1,4-dioxane by single ion monitoring) CAM 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three designated storm water sampling locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. The groundwater and storm water monitoring period will continue throughout the lifetime of the alternative until Site cleanup goals are achieved.

Includes data validation, electronic data import, data management and monitoring reports.
16 wells to be included.

Attachment F-4a-29. O&M of Storm Water Drainage Infrastructure - Cost Estimates, UC Davis LEHR/OCL

Assume annual maintenance costs for lift station and drainage channels of $6,000/year for lifetime of drainage system.
Includes detention basins and associated infrastructure, LFU-1 drainage swale, LFU-3 drainage channels

Periodic costs incurred every ten years for repair/replacement of lift station pumps (3 lift stations).

Attachment F-4a-30. O&M of Evapotranspiration Caps - Cost Estimates, UC Davis LEHR/OCL

Inspect and repair evapotranspiration cap for lifetime of cap.
Maintenance includes import of additional topsoil, seeding (1 acre), fertilization/spraying, mowing on an annual basis.
RACER bases costs on total area of caps.

Total Capped Area:	6.17	acres

Attachment F-4a-31. Periodic Costs: Five Year Reviews - Cost Estimates, UC Davis LEHR/OCL

Review and update all documents associated with compliance, performance, institutional/land use controls. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews for period of 30 years

Document Review	
Interviews	Current and Previous Staff Management
	Community Groups
	State Contacts
	Local Government Contacts
	Operations & Maintenance Contractors
	PRPs
	Remedial Design Consultant
Site Inspection	General Site Inspection
	Containment System Inspection
	Monitoring Systems Inspection
	Treatment Systems Inspection
	Regulatory Compliance
	Site Visit Documentation (Photos, Diagrams, etc.)
Report	

Attachment F-4a-32. Contingent Action: Install ST and HFSDA Evapotranspiration Cap - Cost Estimates, UC Davis LEHR/OCL

Description:

Contingency cost: Install evapotranspiration cap at the ST and HFSDA and vegetate with native grasses to promote evapotranspiration. Add cost as contingency, assume cost equals half the cost of the LFU-3 cap (based on area).

Major Assumptions:

Area: 0.35 acres

Cap layers: topsoil cover
clay loam layer
foundation layer

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction. Markers would be added to the cover for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 2 half-days. Licensed surveyor report.

ATTACHMENT F-4b

ALTERNATIVE SW-4 ESTIMATE DOCUMENTATION REPORT

Estimate Documentation Report

System:

RACER Version: 10.3.0
Database Location: C:\Documents and Settings\gch\Application Data\AECOM\RACER 10.3\Racer.mdb

Folder:

Folder Name: Alternative SW-4

Project:

Project ID: FS_Cost
Project Name: Feasibility Study Cost Estimate
Project Category: Detailed Analysis of FS Alternatives

Location
State / Country: CALIFORNIA
City: SACRAMENTO

Location Modifier	Default	User
	1.203	1.203

Options
Database: Modified System
Cost Database Date: 2010
Report Option: Calendar

Description
Cost estimates in support of the CERCLA Feasibility Study for University of California, Davis areas of responsibility at the Laboratory for Energy-Related Health Research/Old Campus Landfill Site. Use Modified System Costs to add custom cost assemblies.

Estimate Documentation Report

Site Documentation:

Site ID: LEHR/OCL
Site Name: Alternative SW-4
Site Type: Land Disposal Units

Media/Waste Type

Primary: Soil
Secondary: N/A

Contaminant

Primary: Multi-Contaminant
Secondary: Radioactive (Low Level)

Phase Names

Pre-Study:
Study:
Design:
Removal/Interim Action:
Remedial Action:
Operations & Maintenance:
Long Term Monitoring:
Site Closeout:

Documentation

Description: Alternative SW-4. VOC "Hot Spot" Removal, Three On-Site Corrective Action Management Units with Evapotranspiration Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring.

See Section 5 of the FS for a description of this alternative.

Support Team: Weiss Staff
References: RACER 2010 System Costs Database

Estimate Documentation Report

Estimated Costs:

Phase Names	Direct Cost	Marked-up Cost
Biological Survey	$34,759	$86,304
Data Gap Investigation	$84,226	$157,394
Decontamination Facilities	$263,219	$582,436
Institutional Controls	$445,672	$1,039,283
Building D&D	$212,542	$314,966
Clearing and Grubbing	$28,374	$52,025
Decommission GW Monitoring Wells	$440,895	$624,402
Elderberry Mitigation	$270,000	$270,000
ET VOC "Hot Spot" Excavation	$112,789	$181,700
LFU-1 Drainage Area Excavation	$376,788	$609,893
LFU-3 Drainage Area Excavation	$166,453	$269,681
Materials Management	$637,106	$1,078,201
Demolish LFU-3 N-S Drainage Channel	$3,354	$5,026
ET PTW and Exploratory Trench Excavation	$77,737	$118,150
LFU-1 PTW and Exploratory Trench Excavation	$193,726	$278,207
LFU-2 VOC "Hot Spot" Excavation	$29,213	$47,289
LFU-2 PTW and Exploratory Trench Excavation	$205,478	$300,782
LFU-3 PTW and Exploratory Trench Excavation	$49,407	$71,311
Excavated Material Consolidation	$26,730	$45,243
LFU-1 Cap	$495,050	$775,270
LFU-2/ET/WBH Cap	$841,253	$1,323,777
LFU-3 Cap	$191,965	$298,888
LFU-3 Drainage Channels	$67,839	$116,775
Off-Site Transportation and Disposal	$1,987,321	$2,386,533
Install New GW Monitoring Wells	$206,121	$297,551
LFU-1 Drainage Swale	$10,442	$18,841
Storm Drainage	$427,802	$687,484
Building Reconstruction	$423,616	$423,616
Groundwater and Storm Water Monitoring	$2,799,569	$3,775,150
O&M Drainage System	$6,000	$6,000
O&M of Caps	$492,099	$1,004,784
Five-Year Reviews	$63,558	$159,250
Periodic Storm Water Lift Station Repair	$2,677	$4,012
Total Cost:	$11,673,782	$17,410,222

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Biological Survey
Description: Perform biological survey of Site prior to remedial action to assess population abundance and diversity of selected plant and animal species.

Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
RCRA Facility Investigation	Yes	100	0

Total Marked-up Cost: $86,304

Technologies:

Estimate Documentation Report

Technology Name: **RCRA Facility Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		No	n/a
Other Investigations		No	n/a
Site Distance		70	MI
Site Complexity		Low	n/a
Site Charact.			
Required Parameters			
Fieldwork Support		No	n/a
Evaluate Site Geology/Hydrogeology		No	n/a
Evaluate Site Soils/Surface Hydrology		No	n/a
Evaluate Site Meteorology		No	n/a
Evaluate Populations and Land Usage		No	n/a
Evaluate Site Ecology		Yes	n/a
Evaluate Nature and Extent of Contamination		No	n/a
Evaluate Contaminant Fate and Transport		No	n/a
Conduct Baseline Risk Assessment		No	n/a
Compose RFI Report		Yes	n/a

Comments: On-Site biological survey with particular emphasis on threatened and endangered species prior to commencement of any remedial activities.

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Data Gap Investigation
Description: Pre-remedial action characterization study to be conducted in the Southern Trenches and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two samples per ten-foot length of the trench plus two end-sidewall samples and additional QA/QC samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY	Yes	5	95
Site Inspection	Yes	100	0

Total Marked-up Cost: $157,394

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey investigation trenches. Registered surveyor report. Assume surveying completed in one day after completion of all trenches.

Estimate Documentation Report

Technology Name: **Site Inspection (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Planning		Yes	n/a
Site Investigation		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		Yes	n/a
Site Distance		70	MI
Site Complexity		Moderate	n/a
Planning			
Required Parameters			
Data Review		Yes	n/a
SI Work Plan		Yes	n/a
SI Supplemental Plans (Health and Safety,		Yes	n/a
Site Investigation			
Required Parameters			
Provide Fieldwork Support		Yes	n/a
Data Validation		Yes	n/a
Compose SI Report		Yes	n/a
Complete Revised HRS Scoring Package		Yes	n/a
Implement Community Relations		Yes	n/a
S&A			
Required Parameters			
Bioassays		No	n/a
Crew Size		2 Field Technicians	n/a
Include QA/QC Samples		Yes	n/a
Groundwater		No	n/a
Surface Water		No	n/a
Sampling - Water: Primary Analytical Template		None	n/a
Sampling - Water: Secondary Analytical Template		None	n/a
Surface Soil		No	n/a
Subsurface Soil		Yes	n/a
Sediment		No	n/a
Sampling - Soil/Sediment: Primary Analytical Template		System Soil - Low Level Radioactive	n/a

Estimate Documentation Report

Technology Name: **Site Inspection (# 1)**

Description	*Default*	*Value*	*UOM*
S&A			
Required Parameters			
Sampling - Soil/Sediment: Secondary Analytical Template		None	n/a
Air		No	n/a
Soil Gas		No	n/a
Sampling - Air/Soil Gas: Primary Analytical Template		None	n/a
Sampling - Air/Soil Gas: Secondary Analytical Template		None	n/a
Media			
Required Parameters			
Subsurface Soil: Avg. Sample Depth		12	FT
Subsurface Soil: # Sampling Locations		8	EA
Subsurface Soil: # Samples per Location		13	EA
Subsurface Soil: # Rounds		1	EA
Methodology			
Required Parameters			
Methodology: Subsurface Soil	Power Auger	Air Rotary Rig	n/a
Methodology: Turnaround Time		Standard (21 Days)	n/a
Methodology: Quality Control		Level 4	n/a

Comments: Pre-remedial action characterization study to be conducted in the Southern Trenches and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two sample per ten-foot length of the trench plus two end-sidewall samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decontamination Facilities
Description: Provide decontamination facilities for equipment and personnel throughout duration of the remedial action.

Approach: Ex Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Decontamination Facilities	Yes	100	0

Total Marked-up Cost: $582,436

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		554,701	$
Percentage	19	5	%
Dollar Amount		27,735	$

Comments:

Estimate Documentation Report

Technology Name: **Decontamination Facilities (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
New Decontamination Facility Pad Construction		No	n/a
Equipment Rating		n/a	n/a
Equipment Decontamination Operations		Yes	n/a
Equipment Decontamination Operations: Duration		36	weeks
Personnel Decontamination Trailers		Yes	n/a
Personnel Decontamination Trailers: Average Crew Size		10	per shift
Personnel Decontamination Trailers: Duration		36	weeks
Safety Level		D	n/a
Work Shifts			
Secondary Parameters			
Equipment Decontamination	One Shift per Day		n/a
Personnel Decontamination	One Shift per Day		n/a

Comments: Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 36 weeks.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Institutional Controls
Description: Implement and maintain Institutional/Land Use Controls to prohibit Site development or activities incompatible with designated land use.

Approach: In Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
INITIAL LAND SURVEY	Yes	5	95
ADMINISTRATIVE LAND USE CONTROLS	Yes	100	0

Total Marked-up Cost: $1,039,283

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **INITIAL LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		INITIAL LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew to establish legal boundaries defining the Site's boundaries. Licensed surveyor report. 3 man survey crew - 5 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Rename Model		ADMINISTRATIVE LAND USE CONTROLS	n/a
Planning Documents		Yes	n/a
Planning Documents: Start Date		2010	n/a
Implementation		Yes	n/a
Implementation: Start Date		2010	n/a
Monitoring & Enforcement		Yes	n/a
Monitoring & Enforcement: Start Date		2010	n/a
Modification/Termination		No	n/a
Type of Site		Former Government Site	n/a
Planning Documents			
Required Parameters			
LUC Assurance Plan (LUCAP)		Yes	n/a
LUC Assurance Plan (LUCAP): Plan Complexity		Medium	n/a
LUC Implementation Plan (LUCIP)		Yes	n/a
LUC Implementation Plan (LUCIP): Number		1	EA
LUC Implementation Plan (LUCIP): Plan Complexity		Medium	n/a
Long-term Stewardship (LTS) Plan		No	n/a
Memorandum of Agreements (MOA)		No	n/a
Installation (or City) Master Plan		No	n/a
Construction Permitting		Yes	n/a
Construction Permitting: Number		1	EA
Construction Permitting: Plan Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Plan Complexity		Low	n/a
Planning Meetings			
Required Parameters			
LUCAP: Number of Meetings		2	EA
LUCAP: Number of People		2	EA

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Planning Meetings			
Required Parameters			
LUCAP: Number of Days		1	EA
LUCAP: Airfare Cost		0	$
LUCAP: Mileage to Meeting Site		70	MI
LUCIP: Number of Meetings		2	EA
LUCIP: Number of People		2	EA
LUCIP: Number of Days		1	EA
LUCIP: Airfare Cost		0	$
LUCIP: Mileage to Meeting Site		70	MI
Construction Permitting: Number of Meetings		1	EA
Construction Permitting: Number of People		1	EA
Construction Permitting: Number of Days		1	EA
Construction Permitting: Airfare Cost		0	$
Construction Permitting: Mileage to Meeting Site		70	MI
GIS/Overlay Maps: Number of Meetings		1	EA
GIS/Overlay Maps: Number of People		1	EA
GIS/Overlay Maps: Number of Days		1	EA
GIS/Overlay Maps: Airfare Cost		0	$
GIS/Overlay Maps: Mileage to Meeting Site		70	MI
Implementation			
Required Parameters			
Modify Installation (or City) Master Plan		No	n/a
Deed Notification		Yes	n/a
Deed Notification: Number		1	EA
Deed Notification: Task Complexity		Low	n/a
Negotiating Easements		No	n/a
Restrictive Covenants		Yes	n/a
Restrictive Covenants: Number		1	EA
Restrictive Covenants: Task Complexity		Low	n/a
Equitable Servitudes		No	n/a
Access Control Signs		Yes	n/a

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Implementation			
Required Parameters			
Access Control Signs: Number		22	EA
Access Control Signs: Task Complexity		Low	n/a
Utility Notification Service		Yes	n/a
Access Control Signs: Number		1	EA
Access Control Signs: Task Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Task Complexity		Low	n/a
Develop Finding of Suitability to Transfer (FOST)		No	n/a
Monitoring & Enforcement			
Required Parameters			
Duration of Monitoring/Enforcement		31	Years
Notice Letters		No	n/a
Guard Service/Security		No	n/a
Reports & Certifications		Yes	n/a
Reports & Certifications: Frequency		Annually	n/a
Site Visits/Inspections		Yes	n/a
Site Visits/Inspections: Number		1	EA
Site Visits/Inspections: Safety Level		D	n/a
Site Visits/Inspections: Duration		1	Days
Site Visits/Inspections: Number of People		2	EA
Site Visits/Inspections: Frequency		Annually	n/a
Site Visits/Inspections: Airfare		0	$ Per Ticket
Site Visits/Inspections: Mileage		70	MI

Comments: Implement and maintain land use controls to prohibit Site development or activities incompatible with designated land use.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building D&D
Description: Prior to implementation of the alternative, nine Site buildings will be demolished and associated hazardous demolition material will be disposed off-Site. It is assumed that five percent of the demolition waste is contaminated with asbestos, lead, and PCBs. Non-hazardous building material will be recycled or disposed of in an on-Site CAMU. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated.
Apply 15% contingency for worker safety and additional waste volume.

Approach: Ex Situ
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Professional Labor Management	Yes	100	0
D&D, Sampling and Analysis	Yes	100	0

Total Marked-up Cost: $314,966

Technologies:

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		630	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		33.25	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		1.75	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		1,200	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		63.65	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		3.35	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose storage building (H-253) near northwest corner of Landfill No. 3. Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		191,492	$
Percentage	19.8	19.8	%
Dollar Amount		37,915	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Mobilizations		1	EA
Mobilization Distance		70	MI (One-way)
Soil/Sediment: # of Samples		0	EA
Soil/Sediment: Survey Area		0	SF
Water/Liquid: # of Samples		0	EA
Water/Liquid: Survey Area		0	SF
Building Surfaces: # of Samples		141	EA
Building Surfaces: Survey Area		43,287	SF
Sampling Rate		75	Per Day
Sampling Crew Size		2 Radiation Technicians, 1 Health and Safety Officer	n/a
Safety Level		D	n/a
Laboratory Analyses			
Required Parameters			
Soil: Alpha		No	n/a
Soil: Beta		No	n/a
Soil: Gamma		No	n/a
Soil: VOC"s		No	n/a
Soil: SVOC"s		No	n/a
Soil: Fuels		No	n/a
Soil: Pesticides		No	n/a
Soil: PCB"s		No	n/a
Soil: Metals		No	n/a
Soil: Acids/Caustics		No	n/a
Soil: Ordnance Residual		No	n/a
Water: Alpha		No	n/a
Water: Beta		No	n/a
Water: Gamma		No	n/a
Water: VOC"s		No	n/a
Water: SVOC"s		No	n/a

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Laboratory Analyses			
Required Parameters			
Water: Fuels		No	n/a
Water: Pesticides		No	n/a
Water: PCB"s		No	n/a
Water: Metals		No	n/a
Water: Acids/Caustics		No	n/a
Water: Ordnance Residual		No	n/a
Building: Alpha		No	n/a
Building: Beta		No	n/a
Building: Gamma		No	n/a
Building: VOC"s		No	n/a
Building: SVOC"s		No	n/a
Building: Fuels		No	n/a
Building: Pesticides		No	n/a
Building: PCB"s		Yes	n/a
Building: Metals		Yes	n/a
Building: Acids/Caustics		No	n/a
Building: Ordnance Residual		No	n/a
QA Blanks: Soil/Sediment		0	%
QA Blanks: Water/Liquid		0	%
QA Blanks: Building		15	%
Hand Scanning		1	Days
Adjustments/Productivity			
Secondary Parameters			
Turnaround Time		Standard (21 Days)	n/a
Quality Control		Level 1	n/a
Height Adjustment	15	15	%
Protective Clothing	23	23	%
RADCON	15	15	%
Respiratory Protection	38	38	%
Breaks	10	10	%

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Adjustments/Productivity			
Secondary Parameters			
Productivity Loss Multiplier	2.32	n/a	n/a

Comments: Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. One sample per ~300 ft2. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals. At two Geriartics Buildings H-292 and H-293, include radiological analyses.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET VOC "Hot Spot" Excavation
Description: Excavate ET VOC "Hot Spot." Apply 15% contingency for radiological work and backfill requirements.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Excavation	Yes	5	95

Total Marked-up Cost: $181,700

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Eastern Trenches VOC "Hot Spot" excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,686	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring (included under Professional Labor Management).

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		140,413	$
Percentage	19.9	19.9	%
Dollar Amount		27,942	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		713	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	58	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	6	6	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate the ET VOC "Hot Spot," East to a depth of 20 feet bgs. Backfill with clean fill.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		492	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	63	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate ET VOC "Hot Spot," West.

Excavation to be backfilled and compacted with Site consolidated soil/solid waste.
Level C PPE assumed because of potential VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Area Excavation
Description: Excavate LFU-1 Drainage Area. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean fill. Revegetate surface. Load and haul soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $609,893

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		491,228	$
Percentage	19.2	19.2	%
Dollar Amount		94,316	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		7,215	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	14	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	41	41	EA
Number of Composites Submitted to Lab	11	11	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 1 Drainage Area.
Collect default number of confirmation samples.
Backfill and compact with clean fill. Revegetate surface, a drainage swale will be constructed in this area after excavation..

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		3,839	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul Landfill Unit 3 soil and waste to stockpiling areas. Assume stockpile area is immediately adjacent to LFU-3 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Clearing and Grubbing
Description: Clear and grub areas to be excavated and/or capped.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80

Total Marked-up Cost: $52,025

Technologies:

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		2.42	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		424.830993652344	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 1 footprint.
Current satellite photo and photographs from recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume grubbed material will be kept on-site for re-use.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		3.48	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		610.914001464844	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 2/Eastern Trenches/Waste Burial Holes footprint.
Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume chipping and stockpiling is done on-site.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		1.01	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		177.30549621582	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear trees and vegetation at Landfill Unit 3. Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range. Assume grubbed material is stored and re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decommission GW Monitoring Wells
Description: Decommission groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Well Abandonment	Yes	20	80
Professional Labor Management	Yes	100	0
Residual Waste Management	Yes	80	20

Total Marked-up Cost: $624,402

Technologies:

Estimate Documentation Report

Technology Name: **Well Abandonment (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Abandon Wells			
Required Parameters			
Technology/Group Name		DDC Wells	n/a
Number of Wells		3	EA
Well Depth		85	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		TP-1 through TP-5	n/a
Number of Wells		5	EA
Well Depth		81	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-1 Wells	n/a
Number of Wells		6	EA
Well Depth		64	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-2 Well	n/a
Number of Wells		1	EA
Well Depth		86	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a

Comments: Decommission groundwater monitoring wells according to Table 5-3.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		594,669	$
Percentage	19	5	%
Dollar Amount		29,733	$

Comments:

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		41	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Drainage Area Excavation
Description: Clear and grub Landfill Unit 3 area. Excavate LFU-3 Drainage Area. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean import soil. Revegetate surface. Load and haul Landfill Unit 3 soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $269,681

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		204,956	$
Percentage	19.7	19.7	%
Dollar Amount		40,376	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		2,742	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	20	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	18	18	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 3 Drainage Area.
Collect default number of confirmation samples.
Backfill and compact with clean import soil. Revegetate surface.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		3,839	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul Landfill Unit 3 soil and waste to stockpiling areas. Assume stockpile area is immediately adjacent to LFU-3 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Elderberry Mitigation
Description: Identify elderberry shrub clusters within work boundaries and relocate them within UC boundaries.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ELDERBERRY SHRUB CLUSTER RELOCATION	No	0	0

Total Marked-up Cost: $270,000

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **ELDERBERRY SHRUB CLUSTER RELOCATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ELDERBERRY SHRUB CLUSTER RELOCATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.02	n/a
Safety Level		D	n/a

Comments: Cost for Elderberry mitigation based on previous transplanting operations at UC Davis.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Materials Management
Description: Excavated material will be handled in accordance with a Materials Management Plan. Materials Management includes the cost of storage/stockpiling, sorting of waste streams, waste characterization, and staging for final disposal. Disposal is handled in a separate cost element. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Drum Staging	Yes	20	80
LOADER FOR STAGING AREA	Yes	0	100
WASTE CHARACTERIZATION SAMPLING	Yes	100	0
Professional Labor Management	Yes	80	20
Bulk Material Storage	Yes	20	80
Bulk Material Storage	Yes	20	80
SIFTING OF EXCAVATED MATERIAL	Yes	20	80

Total Marked-up Cost: $1,078,201

Technologies:

Estimate Documentation Report

Technology Name: **Drum Staging (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Waste		Solid	n/a
Solid: To be Staged		38	EA
Solid: Leaking/Damaged Requiring Overpacks		0	EA
Solid: To be Sampled		38	EA
Solid: Second Sample per Drum		No	n/a
Temporary Staging Area		438	SF
Drums to be Consolidated (Drums to Bulk)		38	EA
Drum Average Percentage Full		65	%
Safety Level		C	n/a
Handling			
Secondary Parameters			
Overpacks		85 Gal. Steel Salvage Drum	n/a
First Sample Analysis: Liquid		Waste Characterization, Liquid	n/a
First Sample Analysis: Solid / Sludge		Waste Characterization, Solids	n/a
Second Sample Analysis: Liquid		None	n/a
Second Sample Analysis: Solid / Sludge		None	n/a
Storage			
Secondary Parameters			
Liner/Temporary Staging Area	60 Mil Polymeric Liner, HDPE	60 Mil Polymeric Liner, HDPE	n/a
Drum Storage Systems: Quantity	0	0	EA
Drum Storage Systems: Type	Poly Spill Pallet, 4 Drum Cap	Poly Spill Pallet, 4 Drum Cap	n/a
Containment Berms: Quantity	0	0	EA
Containment Berms: Type	10" x 10" x 17", 750 Gallon	10" x 10" x 17", 750 Gallon	n/a

Comments: Drums for principal threat wastes/lab packs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LOADER FOR STAGING AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LOADER FOR STAGING AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled dirt needs to be moved around. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

Technology Name: **User Defined Estimate (# 2)**
User Name: **WASTE CHARACTERIZATION SAMPLING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WASTE CHARACTERIZATION SAMPLING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.06	n/a
Safety Level		D	n/a

Comments: Assume the included materials and analyses for waste characterization prior to final disposal of PTW and VOC "Hot Spot" TEV.
Assume 1 sample per 300 CY for costing purposes only. Actual sampling rate will be considered during remedial design.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		363,691	$
Percentage	19.4	19.4	%
Dollar Amount		70,556	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Bulk Material Storage (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Roll-Off/Bulk Containers/Tanks	n/a
Quantity of Material		150	CY
Safety Level		C	n/a
Secondary			
Secondary Parameters			
Size	30 CY Open Top Roll-Off Container	30 CY Open Top Roll-Off Container	n/a
Quantity	6	6	n/a

Comments: Bulk containers for PTW.

Estimate Documentation Report

Technology Name: **Bulk Material Storage (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Soil Bermed Storage Area	n/a
Quantity of Material		19,882	CY
Safety Level		D	n/a
Secondary			
Secondary Parameters			
Storage Area Quantity	1	1	EA
Storage Area Length	213	213	FT
Storage Area Width	213	213	FT
Berm Height	2	2	FT
Berm Top Width	2	2	FT
Slope: Feet Run / 1 Foot Rise	3	3	FT
Polymeric Liner Material	40 Mil Polymeric Liner, PVC	40 Mil Polymeric Liner, PVC	n\a
Polymeric Liner Quantity	1	1	EA
Soil Liner Material	None	None	n/a
Soil Liner Thickness	0	0	IN
Liner Protection Layer Material	Gravel	Gravel	n/a
Liner Protection Layer Thickness	12	12	IN

Comments: Stockpile TEV.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **SIFTING OF EXCAVATED MATERIAL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		SIFTING OF EXCAVATED MATERIAL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.90	n/a
Safety Level		C	n/a

Comments: Sorting of excavated material to segregate principal threat wastes. Assume the use of similar equipment used under the MEC Sifting assembly. Assume rate of sorting is approximately 200 CY/day.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 PTW and Exploratory Trench Excavation
Description: Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added volume of excavation, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $71,311

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		40	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU3-T1 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		44	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	59	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	8	EA
Number of Composites Submitted to Lab	5	8	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU3-T2 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		46,193	$
Percentage	20.1	20.1	%
Dollar Amount		9,285	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		117	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		1	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Demolish LFU-3 N-S Drainage Channel
Description: The concrete lined drainage channel which partially overlays LFU-3 will be removed.
New N-S drainage channels will be re-constructed post-remediation.
This cost estimate assumes that a termporary drainage channel will not have to be created since the remedial action will take place in the dry season.

Approach: Ex Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
DEMOLISH LFU3 N-S DRAINAGE CHANNEL	Yes	100	0

Total Marked-up Cost: $5,026

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **DEMOLISH LFU3 N-S DRAINAGE CHANNEL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DEMOLISH LFU3 N-S DRAINAGE CHANNEL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.01	n/a
Safety Level		D	n/a

Comments: Demolish gunnite lined north-south drainage channel overlaying Landfill Unit 3 in area where waste cells lie adjacent to channel. Assume thickness of gunnite lining = 2inches, length of channel is 270 feet, top width of channel is 30 feet, base width of channel is 16 feet, depth of channel is 7 feet. Assume 160 feet of the channel will need to be demolished. The channel will be demolished to remove underlying waste. The channel will be restored in its original location. Demolished concrete will be re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added excavation volume, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $118,150

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	67	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET Trench 24 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		12	CY
Depth		7	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	69	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET Trench 26 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		61	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	55	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET TRL-45 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		57	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	64	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET TRL-48 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		18	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	59	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	5	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T1 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	6	EA
Number of Composites Submitted to Lab	5	6	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T2 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	6	EA
Number of Composites Submitted to Lab	5	6	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T3 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	6	EA
Number of Composites Submitted to Lab	5	6	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T4 PTW excavation.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		86,528	$
Percentage	20	20	%
Dollar Amount		17,306	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		324	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		0.5	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added excavation volume, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $278,207

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		83	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	51	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	13	EA
Number of Composites Submitted to Lab	5	13	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T6 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		80	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	51	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	13	EA
Number of Composites Submitted to Lab	5	13	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T7 PTW excavation

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		210,234	$
Percentage	19.7	19.7	%
Dollar Amount		41,416	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		838	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		137	CY
Depth		7	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	40	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-35 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		55	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	45	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-36 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		38	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T1 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		40	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T2 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		41	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T3 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		57	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	56	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	10	EA
Number of Composites Submitted to Lab	5	10	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T4 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		69	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	53	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	11	EA
Number of Composites Submitted to Lab	5	11	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T5 PTW excavation

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		2.4	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added volume of excavation, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $300,782

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		132	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	15	EA
Number of Composites Submitted to Lab	5	15	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T3 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		132	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	15	EA
Number of Composites Submitted to Lab	5	15	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T4 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		228,564	$
Percentage	19.7	19.7	%
Dollar Amount		45,027	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		953	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		11	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	74	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-2 TRL-12 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		48	CY
Depth		15	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	78	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-22 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		11	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	65	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-2 TRL-20 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		174	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	54	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	19	EA
Number of Composites Submitted to Lab	5	19	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T1 excavation. Collect soil/solid waste samples.

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		174	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	54	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	19	EA
Number of Composites Submitted to Lab	5	19	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T2 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		2.2	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 VOC "Hot Spot" Excavation
Description: Excavate LFU-2 VOC "Hot Spot." Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $47,289

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,210	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	52	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate the LFU-2 VOC "Hot Spot" to a depth of 20 feet bgs.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,693	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul LFU-2 VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		28,263	$
Percentage	20.1	20.1	%
Dollar Amount		5,681	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Cap
Description: Install evapotranspiration cap at LFU-1. Dispose non-hazardous waste generaged by construction activities. Survey boundaries of capped area. 10% contingency applied for waste consolidation.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
GRADE AROUND LFU-1 TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Off-site Transportation and Waste Disposal	Yes	5	95
LAND SURVEY OF LFU-1 GRADED AREA	Yes	5	95
Capping	Yes	20	80

Total Marked-up Cost: $775,270

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **GRADE AROUND LFU-1 TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND LFU-1 TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around LFU-1 to promote drainage into constructed storm drain which will connect to discharge point at LFU-1.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		644,806	$
Percentage	18.9	18.9	%
Dollar Amount		121,868	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		5	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-1 capping activities. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF LFU-1 GRADED AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF LFU-1 GRADED AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Licensed surveyor report. 3 man survey crew - 2 x 1/2 day. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		Evapotranspiration Cap	n/a
Acres		2	AC
Length		417	FT
Width		209	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	52	52	FT
Horizontal Projection of Top Slope	52	52	FT
Evapotranspiration Cap			
Secondary Parameters			
Vegetation Type	Seasonal Grass Mixture	Seasonal Grass Mixture	n/a
Top Cover Thickness	6	6	IN
Top Cover Borrow Source	Off-site	Off-site	n/a
Clay Loam Layer Thickness	36	36	IN
Clay Loam Layer Borrow Source	Off-site	Off-site	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a
Lysimeter	1	1	n/a

Comments: Install LFU-1 evapotranspiration cap.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Excavated Material Consolidation
Description: Consolidate non-PTW excavated material from excavations in on-Site CAMUs. 10% contingency applied for consolidation of additional volume.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
CONSOLIDATE WASTE IN LFU-1 CAMU	Yes	5	95
CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU	Yes	5	95
CONSOLIDATE WASTE IN LFU-3 CAMU	Yes	5	95

Total Marked-up Cost: $45,243

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **CONSOLIDATE WASTE IN LFU-1 CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LFU-1 CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in LFU-1 CAMU.

Technology Name: **User Defined Estimate (# 2)**
User Name: **CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in LFU-2/ET/WBH CAMU.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **CONSOLIDATE WASTE IN LFU-3 CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LFU-3 CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in LFU-3 CAMU.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2/ET/WBH Cap
Description: Install evapotranspiration cap at the LFU2, ETs and WBHs. Dispose non-hazardous waste generaged by construction activities. Survey boundaries of graded area.
Apply 10% contingency.

Approach: In Situ
Start Date: June, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
Capping	Yes	20	80
LAND SURVEY OF LFU-2/ET/WBH GRADED AREA	Yes	5	95
Off-site Transportation and Waste Disposal	Yes	5	95
GRADE AROUND CAP TO PROMOTE DRAINAGE	Yes	5	95

Total Marked-up Cost: $1,323,777

Technologies:

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		1,115,505	$
Percentage	17.9	17.9	%
Dollar Amount		199,675	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		Evapotranspiration Cap	n/a
Acres		3.5	AC
Length		552	FT
Width		276	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	69	69	FT
Horizontal Projection of Top Slope	69	69	FT
Evapotranspiration Cap			
Secondary Parameters			
Vegetation Type	Seasonal Grass Mixture	Seasonal Grass Mixture	n/a
Top Cover Thickness	6	6	IN
Top Cover Borrow Source	Off-site	Off-site	n/a
Clay Loam Layer Thickness	36	36	IN
Clay Loam Layer Borrow Source	Off-site	Off-site	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a
Lysimeter	1	1	n/a

Comments: Install evapotranspiration cap.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF LFU-2/ET/WBH GRADED AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF LFU-2/ET/WBH GRADED AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Licensed surveyor report. 3 man survey crew - 2 x 1/2 day. Licensed surveyor report.

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		5	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-2/ET/WBH soil cover construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **GRADE AROUND CAP TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND CAP TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around soil cover to promote drainage.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Cap
Description: Install evapotranspiration cap. Dispose non-hazardous waste generaged by construction activities. The existing E-W drainage channels will be re-routed to the south. Survey boundaries of capped area. Assume 10% contingency.

Approach: In Situ
Start Date: June, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF LFU-3 GRADED AREA	Yes	5	95
Capping	Yes	20	80
GRADE AROUND LFU-3 TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Off-site Transportation and Waste Disposal	Yes	5	95

Total Marked-up Cost: $298,888

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF LFU-3 GRADED AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF LFU-3 GRADED AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Licensed surveyor report. 3 man survey crew - 2 x 1/2 day. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		Evapotranspiration Cap	n/a
Acres		0.71	AC
Length		249	FT
Width		124	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	31	62	FT
Horizontal Projection of Top Slope	31	0	FT
Evapotranspiration Cap			
Secondary Parameters			
Vegetation Type	Seasonal Grass Mixture	Seasonal Grass Mixture	n/a
Top Cover Thickness	6	6	IN
Top Cover Borrow Source	Off-site	Off-site	n/a
Clay Loam Layer Thickness	36	36	IN
Clay Loam Layer Borrow Source	Off-site	Off-site	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a
Lysimeter	1	1	n/a

Comments: Install LFU-3 evapotranspiration cap. Excavation of new LFU-3 east-west drainage channel will yield 364 CY of material. 140 CY is required for backfilling original LFU-3 east-west drainage channel. 224 CY is available for grading.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **GRADE AROUND LFU-3 TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND LFU-3 TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around LFU-3 soil cover to promote drainage into constructed storm drain channels to the east and south.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		246,794	$
Percentage	19.7	19.7	%
Dollar Amount		48,618	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		10	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-3 cap construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Drainage Channels
Description: The concrete lined drainage channel which partially overlays LFU-3, will be reconstructed post-remediation.
The E-W LFU-3 drainage channel will also be reconstructed south of its original location.

Approach: Ex Situ
Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
N-S DRAINAGE CHANNEL CONSTRUCTION	Yes	20	80
E-W DITCH CONSTRUCTION	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $116,775

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **N-S DRAINAGE CHANNEL CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		N-S DRAINAGE CHANNEL CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Reconstruction of north-south, drainage ditch. Assume 160 feet need to be restored with concrete lining.

Technology Name: **User Defined Estimate (# 2)**
User Name: **E-W DITCH CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		E-W DITCH CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Construction of new east-west drainage ditch at LFU-3, south of its original location. Assume 260 feet needed. This drainage ditch currently drains the Raptor Center and vicinity. It will discharge into the larger N-S concrete lined drainage ditch.

Technology Name: **User Defined Estimate (# 3)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage channels. 2 x 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Off-Site Transportation and Disposal
Description: Transport and dispose of RCRA hazardous, mixed waste, Non-RCRA hazardous, LLRW, and non-hazardous waste material generated by Site remedial excavations. Hazardous wastes will be transported to Class I hazardous waste facility; solid LLRW and mixed waste to LLRW accepting facility; and non-hazardous materials at Class II non-hazardous landfill. Assume drummed PTW will be sent to the LLRW accepting facility, and biological waste will be incinerated.

Approach: Ex Situ
Start Date: September, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0

Total Marked-up Cost: $2,386,533

Technologies:

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Non-leaking Drums	n/a
Quantity of Non-Leaking Drums		38	Drums
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dipose of drums containing PTW requiring stabilization. Assume default acceptance and treatment fee. Assume 594 mile transport distance.

Technology Name: **Off-site Transportation and Waste Disposal (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Low-Level Radioactive Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		1,339	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose LLRW. Assume $1,080/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Mixed Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		75	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose mixed waste. Assume $2,814/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		780	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose RCRA hazardous waste. Assume $170/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		276	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose non-RCRA hazardous waste. Assume $85/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Storm Drainage
Description: Install storm drainage controls for the lined and capped CAMU. Drainage piping will be added to the perimeter of the CAMU which will discharge runoff into a detention basin. The detention basin will discharge to either the LFU-1 discharge point or the LFU-3 north-south concrete lined drainage channel depending on the basin's location.

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY	Yes	5	95
STORM WATER DETENTION BASIN	Yes	20	80
Excavation	Yes	5	95
STORM WATER DETENTION BASIN	Yes	20	80
Excavation	Yes	5	95

Total Marked-up Cost: $687,484

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage control system. 1/2 day. Registered surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **STORM WATER DETENTION BASIN**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		STORM WATER DETENTION BASIN	n/a
WBS Type		HTRW	n/a
Selected WBS		331.09.07	n/a
Safety Level		D	n/a

Comments: Install detention basin to receive runoff from the LFU-1 and LFU-2/ET/WBH capped CAMUs.

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,346	CY
Depth		9	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	24	70	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate detention basin serving LFU-1 and LFU-2/ET/WBH CAMUs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **STORM WATER DETENTION BASIN**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		STORM WATER DETENTION BASIN	n/a
WBS Type		HTRW	n/a
Selected WBS		331.09.07	n/a
Safety Level		D	n/a

Comments: Install detention basin to receive runoff from the LFU-3 capped CAMU.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		319	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	35	84	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate detention basin at LFU-3.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Swale
Description: Install a north-south trending unlined storm drainage channel in LFU-1 drainage area (assume 380 ft).

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LFU-1 DRAINAGE SWALE	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $18,841

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LFU-1 DRAINAGE SWALE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LFU-1 DRAINAGE SWALE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: North-south trending unlined storm drainage channel will be constructed in LFU-1 drainage area (assume 380 ft).

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage improvements. 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Install New GW Monitoring Wells
Description: Install, develop, and survey new groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Groundwater Monitoring Well	Yes	40	60
Residual Waste Management	Yes	80	20
LAND SURVEY	Yes	5	95
Professional Labor Management	Yes	80	20
WELL DEVELOPMENT	Yes	40	60
DDC WELL AND PIEZOMETER INSTALLATION	Yes	100	0

Total Marked-up Cost: $297,551

Technologies:

Estimate Documentation Report

Technology Name: **Groundwater Monitoring Well (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Aquifers		Two	n/a
Include Guard Posts		No	n/a
Depth to Groundwater to Aquifer One		50	FT
Number of Wells to Aquifer One		9	EA
Depth to Groundwater to Aquifer Two		50	FT
Number of Wells to Aquifer Two		1	EA
Safety Level		D	n/a
Aquifer One			
Required Parameters			
Aquifer One: Average Well Depth		70	LF
Aquifer One: Formation Type		Unconsolidated	n/a
Aquifer One: Drilling Method		Hollow Stem	n/a
Aquifer One: Well Diameter		2 Inch	n/a
Aquifer One: Well Construction Material		PVC Schedule 80	n/a
Aquifer One: Split Spoon Sample Collection		Yes	n/a
Aquifer One: Average Number of Soil Samples per Well		0	EA
Aquifer One: Soil Analytical Template		None	n/a
Aquifer One: Safety Level		D	n/a
Aquifer Two			
Required Parameters			
Aquifer Two: Average Well Depth		105	LF
Aquifer Two: Formation Type		Unconsolidated	n/a
Aquifer Two: Drilling Method		Hollow Stem	n/a
Aquifer Two: Well Diameter		4 Inch	n/a
Aquifer Two: Well Construction Material		PVC Schedule 80	n/a
Aquifer Two: Split Spoon Sample Collection		Yes	n/a
Aquifer Two: Average Number of Soil Samples per Well		0	EA
Aquifer Two: Soil Analytical Template		None	n/a
Aquifer Two: Safety Level		D	n/a

Comments: Install new wells according to Table 5-3.

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		10	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey newly installed groundwater monitoring wells. Registered surveyor report. 0.5 day

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		121,933	$
Percentage	19.9	5	%
Dollar Amount		6,097	$

Comments:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **WELL DEVELOPMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WELL DEVELOPMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.01	n/a
Safety Level		D	n/a

Comments: Rent equipment for well develoment for 1 week. One equipment operator and one supervising engineer/geologist.

Technology Name: **User Defined Estimate (# 3)**
User Name: **DDC WELL AND PIEZOMETER INSTALLATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DDC WELL AND PIEZOMETER INSTALLATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.90	n/a
Safety Level		D	n/a

Comments: Installation cost of 3 density-driven convection wells and 3 sets of nested piezometers (each nest containing 3 piezometers) as replacements for those decommissioned in the ET North.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building Reconstruction
Description: Replace buildings H-253, H-290, H-292, and H-293 with three new buildings during site restoration. The two Geriatrics buildings will be reconstructed. The LFU-3 storage building and Cobalt-60 Annex will replaced with one building equal in area to the two combined. The X buildings will not be replaced.

Approach: Ex Situ
Start Date: November, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0

Total Marked-up Cost: $423,616

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-292 (Geriatrics Building No. 1)

Technology Name: **User Defined Estimate (# 2)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-293 (Geriatrics Building No. 2)

Technology Name: **User Defined Estimate (# 3)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace buildings H-253 and H-290 with one builing equivalent in square footage.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 4)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Add 20% contingency to cost of building reconstruction.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Groundwater and Storm Water Monitoring
Description: Groundwater monitoring and storm water monitoring for lifetime of alternative until cleanup objectives are met. Sample collection, analysis, data validation, data import and monitoring reports.

Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
MONITORING	Yes	100	0

Total Marked-up Cost: $3,775,150

Technologies:

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		MONITORING	n/a
Groundwater		Yes	n/a
Surface Soil		No	n/a
Surface Water		Yes	n/a
Subsurface Soil		No	n/a
Sediment		No	n/a
Soil Gas		No	n/a
Air		No	n/a
Site Distance (One-way)		70	MI
Safety Level		D	n/a
Groundwater			
Required Parameters			
Average Sample Depth		50	FT
Samples per Event (First Year)		16	n/a
Samples per Event (Out Years)		16	n/a
Number of Events (First Year)		4	n/a
Number of Events (Out Years)		1	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	System Water - Low Level Radioactive	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Sampling Method	Existing Wells - Low Flow Pump	Existing Wells - Low Flow Pump	n/a
Number of Wells/Day	8	8	EA
Contain Purge Water	Yes	Yes	n/a
Surface Water			
Required Parameters			
Average Sample Depth		0	FT

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
Surface Water			
Required Parameters			
Samples per Event (First Year)		3	n/a
Samples per Event (Out Years)		3	n/a
Number of Events (First Year)		2	n/a
Number of Events (Out Years)		2	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	None	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Number of Samples/Day	8	8	EA
QA/QC			
Secondary Parameters			
Split Samples	1: 10	1: 10	EA
Field Duplicate Samples	1: 10	1: 10	EA
Rinse Blanks (per Round)	1	1	EA
Trip Blanks (per Day)	1	1	EA
Matrix Spikes/Matrix Spike Duplicates	1: 20	1: 20	EA
Data Management			
Secondary Parameters			
Monitoring Plan	Standard	Standard	n/a
Lab Data Review	Stage 2b	Stage 2b	n/a
Submit Data Electronically	Yes	Yes	n/a
Monitoring Reports	Abbreviated	Abbreviated	n/a

Comments: Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the capped areas. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, Semivolatile organic compounds (1,4-dioxane by single ion monitoring) Cam 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. Includes data validation, electronic data import, data management and monitoring reports.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M Drainage System
Description: Annual O&M of constructed storm water drainage control infrastructure.

Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	No	0	0

Total Marked-up Cost: $6,000

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	n/a
WBS Type		HTRW	n/a
Selected WBS		342.05.08	n/a
Safety Level		D	n/a

Comments: Assume annual maintenance costs of $6,000/year for lifetime of drainage system. Includes lined/capped CAMU detention basin, LFU-1 drainage swale, LFU-3 drainage channels. Present value cost for annual O&M of drainage channels. (Cost for this element expressed as annual cost only)

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M of Caps
Description: Operations and maintenance of evapotranspiration capped areas.

Start Date: August, 2012
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Operations and Maintenance	Yes	40	60

Total Marked-up Cost: $1,004,784

Technologies:

Technology Name: **Operations and Maintenance**

Description	*Default*	*Value*	*UOM*
Labor			
Secondary Parameters			
Operations Labor: Type	Exclude from Estimate	Minimum	n/a
Professional Labor: Type	Exclude from Estimate	Minimum	n/a

Comments: Inspect, survey and repair CAMU cap for lifetime of alternative. Assumes some erosion and settlement, but no large scale failure.

Estimate Documentation Report

Technology Name: **Capping (# 1) - (O&M Parameters)**

Description	*Default*	*Value*	*UOM*
O&M Parameters			
Type of Cap		Evapotranspiration Cap	n/a
Acres		6	AC
Vegetation Type		Seasonal Grass Mixture	n/a

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Five-Year Reviews
Description: Five-Year Reviews for all technologies and controls implemented.

Start Date: March, 2015
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Five-Year Review	Yes	100	0

Total Marked-up Cost: $159,250

Technologies:

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Site Complexity		Low	n/a
Document Review		Yes	n/a
Interviews		Yes	n/a
Site Inspection		Yes	n/a
Report		Yes	n/a
Travel		No	n/a
Rebound Study		No	n/a
Start Date		March-2015	n/a
No. Reviews		6	EA
Document Review			
Required Parameters			
5-Year Review Check List		Yes	n/a
Record of Decision		Yes	n/a
Remedial Action Design & Construction		Yes	n/a
Close-Out Report		Yes	n/a
Operations & Maintenance Manuals & Reports		Yes	n/a
Consent Decree or Settlement Records		Yes	n/a
Groundwater Monitoring & Reports		Yes	n/a
Remedial Action Required		Yes	n/a
Previous 5-Year Review Reports		Yes	n/a
Interviews			
Required Parameters			
Current and Previous Staff Management		Yes	n/a
Community Groups		Yes	n/a
State Contacts		Yes	n/a
Local Government Contacts		Yes	n/a
Operations & Maintenance Contractors		Yes	n/a
PRPs		Yes	n/a
Remedial Design Consultant		Yes	n/a
Site Inspection			
Required Parameters			

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
Site Inspection			
Required Parameters			
General Site Inspection		Yes	n/a
Containment System Inspection		Yes	n/a
Monitoring Systems Inspection		Yes	n/a
Treatment Systems Inspection		Yes	n/a
Regulatory Compliance		Yes	n/a
Site Visit Documentation (Photos, Diagrams, etc.)		Yes	n/a
Report			
Required Parameters			
Introduction		Yes	n/a
Remedial Objectives		Yes	n/a
ARARs Review		Yes	n/a
Summary of Site Visit		Yes	n/a
Areas of Non Compliance		Yes	n/a
Technology Recommendations		Yes	n/a
Statement of Protectiveness		Yes	n/a
Next Review		Yes	n/a
Implementation Requirements		Yes	n/a

Comments: Inspect landfill areas for performance issues such as erosion or excessive settlement. Review and update all documents associated with compliance, performance, land use controls, and monitoring results. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews every five years for the lifetime of the alternative.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Periodic Storm Water Lift Station Repair
Description: Periodic costs associated with storm water lift station every ten years.

Start Date: August, 2020
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LIFT STATION PUMP REPLACEMENT	Yes	100	0

Total Marked-up Cost: $4,012

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LIFT STATION PUMP REPLACEMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LIFT STATION PUMP REPLACEMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		342.03.90	n/a
Safety Level		D	n/a

Comments: RACER assembly 33410101 Pump & Motor Cost = $892.37 x 3 lift stations. Assume cost incurred every ten years. Express cost as the one-time payment cost (in base year dollars). Present value over time cost is calculated outside of RACER.

ATTACHMENT F-4c

ALTERNATIVE SW-4 ASSEMBLY LEVEL REPORT

See file in Appendix F Folder titled 'Attachment_F-4c_SW-4_AssemblyLevelReport.xlsx'

ATTACHMENT F-5a

ALTERNATIVE SW-5 COST ASSUMPTIONS

ALTERNATIVE SW-5 COST ASSUMPTIONS

Attachment F-5a-1. Alternative SW-5 Description

Attachment F-5a-2. Planning and Oversight

Attachment F-5a-3. Biological Survey and Elderberry Shrub Cluster Relocation

Attachment F-5a-4. Data Gaps Investigation of the Southern Trenches and Hopland Field Station Disposal Area

Attachment F-5a-5. Decontamination Facilities

Attachment F-5a-6. Building Decommissioning and Demolition, Building Sampling and Analysis

Attachment F-5a-7. Building Decommissioning and Demolition, Building Demolition and Reconstruction

Attachment F-5a-8. Groundwater Monitoring Well Decommissioning

Attachment F-5a-9. Clearing and Grubbing

Attachment F-5a-10. Demolish/Backfill LFU-3 Drainage Channels

Attachment F-5a-11. Excavation of ET Known PTW and Exploratory Trenches

Attachment F-5a-12. Excavation of LFU-1 Known PTW and Exploratory Trenches

Attachment F-5a-13. Excavation of LFU-2 Known PTW and Exploratory Trenches

Attachment F-5a-14. Excavation of LFU-3 Exploratory Trenches

Attachment F-5a-15. Excavation of ET VOC “Hot Spot”

Attachment F-5a-16. Excavation of LFU-1 Drainage Area

Attachment F-5a-17. Excavation of LFU-2 VOC “Hot Spot”

Attachment F-5a-18. Excavation of LFU-3 Drainage Area

Attachment F-5a-19. Materials Management

Attachment F-5a-20. Excavated Materials Consolidation

Attachment F-5a-21. Off-Site Transportation and Disposal

Attachment F-5a-22. Install LFU-1 Asphalt Cap

Attachment F-5a-23. Install LFU-2/ET/WBH Asphalt Cap

Attachment F-5a-24. Install LFU-3 Asphalt Cap

Attachment F-5a-25. Install New Groundwater Monitoring Wells

Attachment F-5a-26. Storm Drainage Controls

Attachment F-5a-27. O&M: Institutional Controls

Attachment F-5a-28. O&M: Groundwater and Storm Water Monitoring

Attachment F-5a-29. O&M of Storm Water Drainage Infrastructure

Attachment F-5a-30. O&M of Asphalt Caps

Attachment F-5a-31. Periodic Costs: Five Year Reviews

Attachment F-5a-32. Contingent Action: Install ST and HFSDA Asphalt Cap

SW-5. VOC "Hot Spot" Removal, Three On-Site Corrective Action Management Units with Asphalt Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring — See Section 5 of the FS - Volume 1 for a description of this alternative.

Alternative SW-5 Components Listed:

- Planning and oversight
- Biological Survey
- Elderberry Shrub Cluster Relocation
- Data Gap Investigation
- Decontamination Facilities
- Building Decommissioning and Demolition
  - Building Sampling
  - Building Demolition and Reconstruction
- Groundwater Well Decommissioning
- Clearing and Grubbing
- Demolish/Backfill LFU-3 Drainage Channels
- Excavation of ET Known PTW and Exploratory Trenches
- Excavation of LFU-1 Known PTW and Exploratory Trenches
- Excavation of LFU-2 Known PTW and Exploratory Trenches
- Excavation of LFU-3 Known PTW and Exploratory Trenches
- ET VOC "Hot Spot," East and West Excavation
- LFU-1 Drainage Area Excavation
- LFU-2 VOC "Hot Spot" Excavation
- LFU-3 Drainage Area Excavation
- Materials Management
- Excavated Materials Consolidation
- Off-Site Transportation and Disposal
- Install LFU-1 Asphalt Cap
- Install LFU-2/ET/WBH Asphalt Cap
- Install LFU-3 Asphalt Cap
- Install New Groundwater Wells
- Storm Drainage Controls
  - Storm Water Collection and Conveyance System
  - Installation of extended detention basins
  - Installation of vegetated swale along eastern edge of LFU-1
  - Redirect drainage ditch south along perimeter of LFU-3
  - Reconstruct LFU-3 north-south drainage channel
- Operations and Maintenance (O&M): Institutional Controls
- O&M: Groundwater and Storm Water Monitoring
- O&M of Storm Water Drainage Infrastructure
- O&M of Caps
- Periodic Costs: Storm Water Lift Station Repair (See O&M of Storm Water Drainage Infrastructure)
- Periodic Costs: Five Year Reviews
- Contingent Action: Install ST and HFSDA Asphalt Cap

Planning and Oversight

Work planning, Health and Safety, Construction Quality Assurance/Quality Control Program, Construction Site Environmental Controls, Materials Management Plan (Table 5-1)

Costs for most planning and oversight are included in RACER's "Professional Labor Management" cost sub-component and in professional labor cost assemblies.
These planning and oversight activities include:

Preparation and submittal of Contract-Required Deliverables
Preparation and submittal of project-specific planning documents (Work Plan, HASP, QAPP, materials management plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Sampling and Construction Quality Control Test Results
Health & Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Costs are estimated as a percentage of the calculated marked-up cost for a given remedial action component through "Professional Labor Management," or through professional labor assemblies included in the estimate for the remedial action cost component.

"Professional Labor Management" includes the costs of typical professional support activities associated with construction, including preparation of site-specific construction activities, incidental permit acquisition, and contract-required deliverables. It also includes typical site-specific professional support activities associated with remedial action including evaluation of sampling and analysis data, comparison of results with project goals, coordination of field activities, and documentation and reporting of field activities. Each cost component has planning and oversight costs associated with it; where professional labor management is not specifically included as a cost sub-component, it is assumed that such cost estimates contain professional labor hours bundled with the cost for implementation of that cost component.

Biological Survey

Conduct a biological survey assessing selected plant, insect and animal species abundance, assess biotic diversity, and survey endangered/critical species' habitat.
Present findings in an biological survey report.

Elderberry Shrub Cluster Relocation

Elderberry shrub clusters located within areas potentially impacted by remediation will be relocated to the Russell Ranch Mitigation Area, as specified in the UC Davis Long Range Development Plan EIR Mitigation Measure 4.4-6(b).

Assume cost is $270,000 based on previous relocations.

Attachment F-5a-4. Data Gaps Investigation of the Southern Trenches and Hopland Field Station Disposal Area - Cost Estimates, UC Davis LEHR/OCL

Description:

Pre-remedial action characterization study to be conducted in the ST and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two sample per ten-foot length of the trench plus two end-sidewall samples. Exploratory trenches will be sited in areas suspected to have waste and not previously investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Assumptions:

Southern Trenches

Total Number of Exploratory Trenches	5	
Depth	6	feet
Number of Samples	80	
Analytes:	Ra-226, Ra-228, Sr-90, Cs-137, isotopic uranium, tritium, and C-14	

Hopland Field Station Disposal Area (HFSDA)

Total Number of Exploratory Trenches	3	
Depth	6	feet
Number of Samples	21	
Analytes:	Ra-226, Ra-228, Sr-90, Cs-137, isotopic uranium, tritium, and C-14	

Survey Exploratory Trenches

Three man crew to survey investigation trenches. Registered surveyor report. Assume surveying completed in one day after completion of investigation.

Attachment F-5a-5. Decontamination Facilities - Cost Estimates, UC Davis LEHR/OCL

Decontamination facilities for equipment and personnel during duration of remedial excavation. Include washout for decontamination of trucks leaving Site. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 36 weeks.

Equipment Decontamination Operation Length	36	weeks
(Assume construction will occur over nine months of the year)		
Average crew size	10	
Shifts	1	per day
Safety Level	Level D	

Prior to implementation of the alternatives, nine Site buildings will be demolished and hazardous waste will be disposed off-Site. Non-hazardous material will be recycled, re-used, or disposed in an on-Site CAMU. It is assumed the buildings are contaminated with asbestos, lead, and PCBs. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated. Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. Assume 1 sample per 300 ft² of building surfaces. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals.

Total Building Surface Area	43,287	ft²
Number of samples	141	(see backup work below)
Sampling rate	75	samples/day
Crew Size	3	2 radiation technicians + 1 Health and Safety Officer

Analytical:	TCLP (RCRA) (EPA 1311)	H-292 and H-293 will also include:
	Testing, TAL metals (6010/7000s)	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total
	Pesticides/PCBs (SW 3550B/SW 8081/8082)	Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic
	Asbestos in Bulk Solids/Soils (Identification by PLM)	Testing, rad analytical vegetation/sediment/soil, gross alpha, total gas flow proportional counting

Two (2) Geriatrics Buildings (H-292 and H-293)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building Surface Area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
100	53	5,285	10	5	walls	3,182	265	10	10
					roof	5,305	442	16	6
					floor	5,285	5,285	196	6
					other building materials (assume 5% of building structure)	---	300	11	9
					Total	13,772	6,292	233	31

Five (5) Vacant Animal Housing Buildings (H-231,-232,-234,-236,-237)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
25	20	500	10	5	walls	917	382	14	4
					roof	502	42	2	1
					floor	500	500	19	1
					other building materials (assume 5% of building structure)		46	2	4
					Total	1,919	970	36	10

Storage Building at West Side of Landfill No. 3 (H-253)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
40	30	1,200	10	5	walls	1,439	120	4	6
					roof	1,205	100	4	4
					floor	1,200	1,200	44	4
					other building materials (assume 5% of building structure)		71	3	5
					Total	3,844	1,491	55	19

Co-60 Annex (H-290)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
30	21	630	10	5	walls	1,039	87	3	4
					roof	632	53	2	1
					floor	630	630	23	1
					other building materials (assume 5% of building structure)		38	1	4
					Total	2,302	808	30	10
					Grand Total (all buildings)	43,287	19,734	731	141

Demolish and dispose of buildings that must be removed to implement remedial action. Assume buildings are contaminated with asbestos, lead, and PCBs. Non-hazardous demolition waste will be disposed of in the on-Site CAMUs; hazardous waste will be sent off-Site for disposal.

Building

1 Demolish, dispose Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

2 Demolish, dispose Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

3

Demolish, dispose Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

4

Demolish, dispose Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

5

Demolish, dispose Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

6

Demolish, dispose Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building

Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

7

Demolish, dispose Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

8

Demolish, dispose storage building near northwest corner of Landfill No. 3 (H-253). Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	1,200	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	64	CY	
Volume Hazardous	3	CY	
Safety Level	Level D		

9 Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	630	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	33	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

Note: A new building will be constructed to replace buildings H-253 and H-290. The replacement is assumed to be 1,830 square feet.

Total Volume of Non-Hazardous Building Demolition Waste to Dispose of Off-Site

0 CY

Total Volume of Hazardous Building Demolition Waste to Dispose of Off-Site

45 CY

Building Reconstruction Costs

Three warehouse buildings will be constructed. Two will be replacements for the Geriatrics buildings, H-292 and H-293, the third is to replace buildings, H-253 and H-290. Cost estimates are based on phone conversation with representative from Allied Steel (12/20/2010) and estimates from Rex Moore Electrical Contractors (12/22/2010) and J.W. McClenahan Company plumbing contractors (1/3/2011). Estimates include engineering, design, and construction. 20% contingency to be added to account for additional cost elements.

1,830 SF warehouse:

Building design and construction (with concrete foundation): $30,000	Dimensions: 35’ x 55’ x 10’	Distance to potable water main = 50 feet
Electrical: $16,031	1 restroom (toilet + sink)	Distance to sanitary sewer = 200 feet
Plumbing: $18,000	1 industrial sink	Distance to electrical distribution = 100 feet
Estimated Cost = $34.99/SF		

5,285 SF warehouse:

Building design and construction (with concrete foundation): $70,000	Dimensions: 53’ x 100’ x 10’	Distance to potable water main = 50 feet
Electrical: $27,214	1 restroom (toilet + sink)	Distance to gas = 100 feet
Plumbing: $47,250	2 industrial sinks	Distance to sanitary sewer = 300 feet
Estimated Cost = $27.34/SF	natural gas connection	

Decommission the following wells (Table 5-3):

Well	Total Boring Depth (ft bgs)	Well Diameter (inches)	Well Screen Type
DDC-1*	85.5	15	PVC
DDC-2*	80	15	PVC
DDC-3*	80	15	PVC
TP-1*	80	15	PVC
TP-2*	79	12.25	PVC
TP-3*	80.5	12.25	PVC
TP-4*	80.5	12.25	PVC
TP-5*	80	12.25	PVC
UCD1-008	56	2	PVC
UCD1-009	51.5	2	PVC
UCD1-012	65	4	PVC
UCD1-013	65	4	PVC
UCD1-050	69.5	4	Stainless Steel
UCD1-051	70	4	Stainless Steel
UCD2-014	86	4	PVC

* If nested well, value is the borehole diameter.

Attachment F-5a-9. Clearing and Grubbing - Cost Estimates, UC Davis LEHR/OCL

Clear and Grub	Clear all trees and vegetation within footprint of excavation/cap. Used current satellite photo and photographs from recent field activities to estimate amount of vegetation to clear. Assumed all removed material will be stored on-Site for re-use.	
LFU-1	Disposal	on-site, chipped
	ACRES	2.4 AC
	FLORA DENSITY	light; 5 trees per acre
LFU-2/ET/WBH	Disposal	on-site, chipped
	ACRES	3.5 AC
	FLORA DENSITY	light; 15 trees per acre
LFU-3	Disposal	on-site, chipped
	ACRES	1.0 AC
	FLORA DENSITY	light; 10 trees per acre

Attachment F-5a-10. Demolish/Backfill LFU-3 Drainage Channels - Cost Estimates, UC Davis LEHR/OCL

Description:

Demolish a portion of the LFU-3 N-S concrete-lined drainage channel along eastern boundary of LFU-3 where waste is underlying and needs to be excavated. Much of the existing channel can be left in place. The drainage area will be re-constructed in its original location post-remediation.

The E-W drainage will be backfilled and will be re-constructed post-remediation south of the LFU-3 capped area.

Major Assumptions:

Estimate the volume of concrete to be removed in demolition of Landfill Unit No. 3 N-S drainage channel:

Length (total)	270	ft	
Length (portion to be demolished)	160	ft	
Top Width of channel	30	ft	
Bottom Width of channel	16	ft	
Depth	7	ft	
Thickness of concrete	0.2	ft	
Length of side wall	9.9	ft	
Volume of channel concrete to remove	964	ft^3	
	36	CY	convert to CY

Estimated backfill for the current E-W channel in the footprint of the proposed cap:

Length	100	ft	
Top Width of channel	9	ft	
Bottom Width of channel	3	ft	
Depth	3	ft	
Volume to backfill:	2,700	ft^3	
	100	CY	convert to CY
	140	**CY**	**bulk factor applied**

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in the ET. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate Exploratory Trenches

ET Trench 24			
Volume		21	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET Trench 26			
Volume		12	BCY
Avg. Depth		7	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET TRL-45			
Volume		61	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET TRL-48			
Volume		57	BCY
Avg. Depth		10	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
ET-T1			
Volume		18	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	5	
ET-T2.			
Volume		21	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	6	
ET-T3			
Volume		21	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	6	
ET-T4			
Volume		21	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	6	
Total Volume Excavated - ET PTW Trenches		324	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.5038	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.8053	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.8146	$/sample
	Testing, purgeable organics (624, 8260)	138.9465	$/sample
	Testing, semi-volatile organics (625, 8270)	465.8413	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99141	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65099	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.5861	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	324	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in LFU-1. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate Exploratory Trenches

LFU-1 TRL-35			
Volume		137	BCY
Avg. Depth		7	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-1 TRL-36			
Volume		55	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU1-T1			
Volume		38	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T2			
Volume		40	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T3			
Volume		41	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T4			
Volume		57	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	10	
LFU1-T5			
Volume		69	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	11	
LFU1-T6			
Volume		83	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	13	
LFU1-T7			
Volume		80	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	13	
Total Volume Excavated -LFU-1 PTW Trenches		838	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.5038	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.8053	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.8146	$/sample
	Testing, purgeable organics (624, 8260)	138.9465	$/sample
	Testing, semi-volatile organics (625, 8270)	465.8413	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99141	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65099	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.5861	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level D	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	838	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in LFU-2. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate Exploratory Trenches

LFU-2 TRL-12			
Volume		11	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-2 TRL-22			
Volume		48	BCY
Avg. Depth		15	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-2 TRL-20			
Volume		11	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU2-T1			
Volume		174	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	19	
LFU2-T2			
Volume		174	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	19	
LFU2-T3			
Volume		132	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	15	
LFU2-T4			
Volume		132	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	15	
Total Volume Excavated		953	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.5038	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.8053	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.8146	$/sample
	Testing, purgeable organics (624, 8260)	138.9465	$/sample
	Testing, semi-volatile organics (625, 8270)	465.8413	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99141	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65099	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.5861	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	953	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate proposed exploratory trenches in LFU-3. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate Exploratory Trenches

LFU3-T1			
Volume		40	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU3-T2			
Volume		44	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	8	
Total Volume Excavated		117	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.5038	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.8053	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.8146	$/sample
	Testing, purgeable organics (624, 8260)	138.9465	$/sample
	Testing, semi-volatile organics (625, 8270)	465.8413	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99141	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65099	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.5861	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level D	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	117	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Excavate ET VOC "Hot Spot," east and west to depth of 20 feet bgs.

Dispose of excavated hazardous material off-Site. For ET VOC "Hot Spot," west backfill and compact with non-hazardous excavated material. For ET VOC "Hot Spot," east backfill and compact with clean fill
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET VOC "Hot Spot," East

Volume		713 BCY
Avg. Depth		20 FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Analytical	Testing, TAL metals (6010/7000s)	283.5038 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.8053 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.8146 $/sample
	Testing, purgeable organics (624, 8260)	138.9465 $/sample
	Testing, semi-volatile organics (625, 8270)	465.8413 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99141 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65099 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.5861 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		998 LCY
Safety Level		Level C

Excavate ET VOC "Hot Spot," West

Volume		492 BCY
Avg. Depth		20 FT
Source of backfill	On-Site	
Number of confirmation samples	None, excavated area is part of capped CAMU	
Percent to be used as backfill (on-Site)		100 %
Off-Site Backfill Required		0 LCY
Safety Level		Level C

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,686 LCY
One Way Haul Distance	500 FT

Land Survey of Excavation

Survey boundaries of ET VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-5a-16. Excavation of LFU-1 Drainage Area - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-1 Drainage Area to ten feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-1 Drainage Area

Volume	7,215	BCY
Avg. Depth	10	FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Analytical		
Testing, TAL metals (6010/7000s)	283.50	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
Testing, purgeable organics (624, 8260)	138.95	$/sample
Testing, semi-volatile organics (625, 8270)	465.84	$/sample
Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Off-Site Backfill Required	10,100	LCY
Safety Level	Level D	

Load and Haul

Volume	10,100	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Land Survey of Excavation

Survey boundaries of Landfill Unit No. 1 Drainage Area excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-5a-17. Excavation of LFU-2 VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-2 VOC "Hot Spot" to depth of 20 feet bgs. Backfill non-hazardous material in excavation.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate LFU-2 VOC "Hot Spot"

Volume		1,210	BCY
Avg. Depth		20	FT
Source of backfill	On-Site		
Number of confirmation samples	None, excavated area is part of capped CAMU		
Percent to be used as backfill (On-Site)		100	%
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,693	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of LFU-2 VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-5a-18. Excavation of LFU-3 Drainage Area - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-3 Drainage Area to ten feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-3 Drainage Area:

Volume		2,742	BCY
Avg. Depth		10	FT
Source of backfill	25 mile distance off-Site	3839	LCY
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		3,839	LCY
Safety Level		Level D	

Load and Haul

Volume	3,839	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Land Survey of Excavation

Survey boundaries of excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency

radiological work	15	%

Materials management includes activities related to the management of excavated soil and solid waste (i.e., stockpiling, sifting/sorting, waste characterization, and staging prior to final disposal).

Bulk Material Storage

Accommodate total excavated volume (TEV) across all subareas to allow for sorting, waste characterization, and staging. Stockpile excavated material in bermed, covered storage area. Safety Level D.

TEV (from subareas excavated under this alternative)	19,882	LCY

Sifting of Excavated Material

Assume rate of sifting = 200 CY/day

Assume the use of similar equipment used under the MEC Sifting assembly. Material will be segregated into PTW, biological waste, and LTW waste streams. Safety Level C.

Soil/solid waste volume (PTW, biological waste, and LTW waste streams):	11,800	LCY
Trommel Screener	3	month
Grizzly Shaker Unit	3	month
Conveyors,	1	unit
Refuse Bottom Hopper	1	unit
5'x16' Double tray Vibrating Screening Unit	1	unit
Two full-time equipment operators, oilers (per screening operation)	986	hrs

Loader for Staging Area

One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled material needs to be moved. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

950, 3.0 CY, Wheel Loader (active)	300	hours
950, 3.0 CY, Wheel Loader (standby)	300	hours
Bobcat with Backhoe	3	month
All Terrain Forklift (Monthly Rental)	3	month

Waste Characterization

Assume the included materials and analyses for waste characterization prior to final disposal of excavated materials. (ET PTW and ET VOC Hotspot excavated material) 1 sample per 300 CY.

Material to be characterized:	PTW + VOC "Hot Spot" TEV	
Total Volume	3,515	LCY
Sampling rate	1	sample/300 CY (or 1 sample per container)
Number of samples	12	
Analytical suite:		
Testing, TAL metals (6010/7000s)	257.73	$/sample
TCLP (RCRA) (EPA 1311), Soil Analysis	120.30	$/sample
Testing, soil & sediment analysis, BTEX/gasoline hydrocarbons mod EPA 8020 (PID/FIFD)	107.37	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	234.37	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	278.01	$/sample
Purgeable organics (624, 8260)	126.31	$/sample
Testing, semi-volatile organics, pkd. column (8250)	416.14	$/sample
Testing, paint filter liquids test (9095)	27.90	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, ignitibility (1010)	31.64	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, corrosivity (1110, NACE)	26.04	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, reactivity (cyanide/sulfide)	72.65	$/sample
Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic	133.34	$/sample
Testing, rad analytical, additional services, characterization of any unknown rad sample (low level)	194.36	$/sample

Drum Staging

Drums for PTW laboratory waste (lab pack) disposal. Includes characterization of wastes in drums. Assume number of drums = volume of PTW in LCY divided by four. Safety Level C.

Total PTW	150	LCY
Store PTW in bulk containers	6	containers (30 CY capacity)
Number of drums	38	drums
Percentage Full	65	%
Temporary Storage Area	438	ft²
Overpacks	85 gal. steel salvage drum	
Waste characterization	1 sample per drum, liquid waste characterization template	

Attachment F-5a-20. Excavated Materials Consolidation - Cost Estimates, UC Davis LEHR/OCL

CAMU	Volume to Consolidate [LCY]
LFU-1 CAMU	5,153
LFU-2 CAMU	5,153
LFU-3 CAMU	3,003

Attachment F-5a-21. Off-Site Transportation and Disposal - Cost Estimates, UC Davis LEHR/OCL

	LLRW (LCY)	**Mixed Waste** (LCY)	**RCRA Hazardous** (LCY)	**Non-RCRA Hazardous** (LCY)	**Non-Hazardous** (LCY)	**Building Hazardous** (LCY)	**Building Non-Hazardous** (LCY)	**Drums/Lab Pack** (number of drums)
Distance to disposal facility	594 miles	594 miles	227 miles	227 miles	93 miles	227 miles	93 miles	594 miles
Volume*	1,339	75	781	276	0	45	0	
Volume for Incineration**	0	0	0	0	0	0	0	
Final Disposal Volumes	**1,339**	**75**	**781**	**276**	**0**	**45**	**0**	**38**

* See Table E-13 (Appendix E, FS - Volume 1).
** Biological waste only.

Attachment F-5a-22. Install LFU-1 Asphalt Cap - Cost Estimates, UC Davis LEHR/OCL

Description: Install asphalt cap over LFU-1.

Major Assumptions:

Area: 2.0 acres

Cap layers:		
	asphalt	
	base	
	soil protective layer	
	geotextile drainage material	97,506 ft²
	geomembrane barrier layer	97,506 ft²
	graded native soil	

Capacity of CAMU to receive waste on top of current grade and underneath cap:
8,356 CY

Volume to compact (above grade and underneath cap):
5,153 LCY

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction. Markers would be added to the cover for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 half-days. Licensed surveyor report.

Attachment F-5a-23. Install LFU-2/ET/WBH Asphalt Cap - Cost Estimates, UC Davis LEHR/OCL

Description: Install asphalt cap over LFU-2/ET/WBH.

Major Assumptions:

Area: 3.5 acres

Cover layers:	asphalt	
	base	
	soil protective layer	
	geotextile drainage material	172,211 ft²
	geomembrane barrier layer	172,211 ft²
	graded native soil	

Capacity of CAMU to receive waste on top of current grade and underneath cap:

14,758 CY

Volume to compact (above grade and underneath cap):

5,153 LCY

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction. Markers would be added to the cover for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 half-days. Licensed surveyor report.

Attachment F-5a-24. Install LFU-3 Asphalt Cap - Cost Estimates, UC Davis LEHR/OCL

Description:

Install asphalt cap over LFU-3.

Major Assumptions:

Area: 0.71 acres

Cover layers:	asphalt	
	base	
	soil protective layer	
	geotextile drainage material	35,041 ft²
	geomembrane barrier layer	35,041 ft²
	graded native soil	

Capacity of CAMU to receive waste on top of current grade and underneath cap:
3,003 CY

Volume to compact (above grade and underneath cap):
3,003 LCY

Excavated Material to add to capped area:

Use material excavated during construction of re-routed east-west LFU-3 drainage channel (364 CY) to reduce import fill requirements (less material used to backfill original east-west channel, 140 CY).

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction. Markers would be added to the cover for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 half-days. Licensed surveyor report.

Attachment F-5a-25. Install New Groundwater Wells - Cost Estimates, UC Davis LEHR/OCL

Groundwater Well Installation - Nine HSU-1 groundwater monitoring wells and one HSU-2 groundwater monitoring well would be installed. The wells will have screen/sand pack intervals of seven feet or less to minimize their potential to act as vertical conduits for downward COC migration, and will be completed just below the bottom of the depth range of seasonal water table fluctuation. In addition, it is assumed that three density-driven convection (DDC) wells and three nested piezometers would be installed as replacements for those decommissioned in the ET North.

9 HSU-1 wells, 70 ft depth, 2" diameter, PVC Schedule 80
1 HSU-2 well, 105 ft depth, 4" diameter, PVC Schedule 80
3 DDC wells, 90 ft depth, 15" diameter borehole. Each DDC well assumed to include:
- Recirculating well: 90 ft depth, 4" diameter, PVC Schedule 80
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 30 ft depth
  - Intermediate: 52 ft depth
  - Deep: 76 ft depth
- Air Injection Tubing: 90 ft depth + 35 feet to blower, 1.25" diameter, PVC Schedule 80
- Vapor Return Line: 50 feet to discharge pipe, 2" diameter, PVC Schedule 80
- Acid Drip Line: 50 feet to acid storage, 0.75" diameter, PVC Schedule 80

3 Sets of Nested Piezometers, 80 ft depth, 15" diameter borehole. Each set of piezometers assumed to include:
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 35 ft depth
  - Intermediate: 53 ft depth
  - Deep: 80 ft depth

Dispose drill cuttings as non-hazardous waste
Survey and develop completed wells

Attachment F-5a-26. Storm Drainage Controls - Cost Estimates, UC Davis LEHR/OCL

LFU-1 Storm Drainage

North-south trending vegetated swale will be constructed to east of LFU-1 cap.

Lining:	soil/vegetation	
Length	400	feet
Erosion Controls - Geotextile	326	yd^2
Erosion Controls - Rip-rap	24	CY

LFU-3 N-S Drainage Channel

North-south trending concrete-lined drainage channel will be reconstructed to match original conditions.

Length	270	ft
Top Width	30	ft
Bottom Width	16	ft
Depth	7	ft
Length of north-south drainage channel to reconstruct	160	ft

LFU-3 E-W Drainage Ditch

Re-route the east-west vegetated drainage ditch to the south of LFU-3. Install new culvert to discharge into north-south, concrete-lined drainage channel.

Lining:	soil/vegetation	
Length	260	ft
Top Width	15	ft
Depth	3	ft
Erosion Controls - Geotextile	212	yd^2
Erosion Controls - Rip-rap	16	CY

LFU-1/LFU-2/ET/WBH Collection and Conveyance System, Lift Station and Extended Detention Basin

Size Basin					
(d) Depth	4	ft	Area HDPE liner	15,410	ft^2
(l) Length	135	ft			
(w_b) Bottom Width	40	ft			
(w_t)Top Width	65	ft			
(V) Volume	28,350	ft^3			
	1,050	CY			
Length of piping:					
to detention basin	2500	ft			
discharge from basin	630	ft			
Number of lift stations:	2		One north of LFU-2 to pump water to detention basin, one east of detention basin to pump toward discharge at LFU-1		
Peak flow:	0.35	cfs			

LFU-3 Collection and Conveyance System, Lift Station and Extended Detention Basin

Size Basin					
(d) Depth	3	ft	Area HDPE liner	4,040	ft^2
(l) Length	60	ft			
(w_b) Bottom Width	10	ft			
(w_t)Top Width	30	ft			
(V) Volume	3,600	ft^3			
	133	CY			
Length of piping:					
to detention basin	920	ft			
discharge from basin	110	ft			
Number of lift stations:	1		On north side of LFU-3 to pump water to detention basin		
Peak flow:	0.35	cfs			

Survey :

Survey newly constructed drainage channels and detention basins. 2 half-days. Registered surveyor report.

Attachment F-5a-27. O&M: Institutional Controls - Cost Estimates, UC Davis LEHR/OCL

Perform initial survey to establish legal boundaries of Site.
Implement and maintain institutional/land use controls.
Document waste placement locations and prohibit Site development or activities incompatible with designated land use.

		# meetings	# people	# days	airfare	mileage to meeting site
Planning Documents	LUC Assurance Plan	2	2	1	0	70
	LUC Implementation Plan	2	2	1	0	70
	Construction Permitting	1	1	1	0	70
	Geographic Information Systems/Overlay Maps	1	1	1	0	70
Implementation	Deed Notification	1	unit			
	Restrictive Covenants	1	unit			
	Access Control Signs	22	unit	Assume one sign every 150 feet around perimeter of land disposal units		
	Utility Notification Service	1	unit			
	GIS/Overlay maps	1	unit			
Monitoring and Enforcement						
	Duration of monitoring/enforcement	100	years or lifetime of project			
	Reports & Certifications	1	per year			
	Site Visits/Inspections	1	per year			
Survey:	5 days, licensed surveyors' report					

Attachment F-5a-28. O&M: Groundwater and Storm Water Monitoring - Cost Estimates, UC Davis LEHR/OCL

Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the land disposal units according to Table 5-3. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, semivolatile organic compounds (1,4-dioxane by single ion monitoring) CAM 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three designated storm water sampling locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. The groundwater and storm water monitoring period will continue throughout the lifetime of the alternative until Site cleanup goals are achieved.

Includes data validation, electronic data import, data management and monitoring reports.
16 wells to be included.

Attachment F-5a-29. O&M of Storm Water Drainage Infrastructure - Cost Estimates, UC Davis LEHR/OCL

Assume annual maintenance costs of $6,000/year for lifetime of drainage system.

Includes detention basins and associated infrastructure, LFU-1 drainage swale, LFU-3 drainage channels

Periodic costs incurred every ten years for repair/replacement of lift station pumps (3 lift stations).

Attachment F-5a-30. O&M of Asphalt Caps - Cost Estimates, UC Davis LEHR/OCL

Inspect, survey and repair asphalt cap for lifetime of caps.

Maintenances includes asphalt re-sealing, re-paving, and repair, as needed, on an annual basis.

RACER bases costs on total area of caps to be maintained.

Total Capped Area:	6.17	acres

Attachment F-5a-31. Periodic Costs: Five Year Reviews - Cost Estimates, UC Davis LEHR/OCL

Review and update all documents associated with compliance, performance, institutional/land use controls. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews for lifetime of alternative.

Document Review	
Interviews	Current and Previous Staff Management
	Community Groups
	State Contacts
	Local Government Contacts
	Operations & Maintenance Contractors
	PRPs
	Remedial Design Consultant
Site Inspection	General Site Inspection
	Containment System Inspection
	Monitoring Systems Inspection
	Treatment Systems Inspection
	Regulatory Compliance
	Site Visit Documentation (Photos, Diagrams, etc.)
Report	

Attachment F-5a-32. Contingent Action: Install ST and HFSDA Asphalt Cap - Cost Estimates, UC Davis LEHR/OCL

Description:

Contingency cost: Install asphalt cap at the ST and HFSDA. Add cost as contingency, assume cost equals half the cost of the LFU-3 cap (based on area).

Major Assumptions:

Area: 0.35 acres

Cover layers:
- asphalt
- base
- soil protective layer
- geotextile drainage material
- geomembrane barrier layer
- graded native soil

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction. Markers would be added to the cover for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 half-days. Licensed surveyor report.

ATTACHMENT F-5b

ALTERNATIVE SW-5 ESTIMATE DOCUMENTATION REPORT

Estimate Documentation Report

System:

RACER Version: 10.3.0
Database Location: C:\Documents and Settings\gch\Application Data\AECOM\RACER 10.3\Racer.mdb

Folder:

Folder Name: Alternative SW-5

Project:

Project ID: FS_Cost
Project Name: Feasibility Study Cost Estimate
Project Category: Detailed Analysis of FS Alternatives

Location
State / Country: CALIFORNIA
City: SACRAMENTO

Location Modifier	Default	User
	1.203	1.203

Options
Database: Modified System
Cost Database Date: 2010
Report Option: Calendar

Description
Cost estimates in support of the CERCLA Feasibility Study for University of California, Davis areas of responsibility at the Laboratory for Energy-Related Health Research/Old Campus Landfill Site. Use Modified System Costs to add custom cost assemblies.

Estimate Documentation Report

Site Documentation:

Site ID: LEHR/OCL
Site Name: Alternative SW-5
Site Type: Land Disposal Units

Media/Waste Type

Primary: Soil
Secondary: N/A

Contaminant

Primary: Multi-Contaminant
Secondary: Radioactive (Low Level)

Phase Names

Pre-Study:
Study:
Design:
Removal/Interim Action:
Remedial Action:
Operations & Maintenance:
Long Term Monitoring:
Site Closeout:

Documentation

Description: Alternative SW-5. VOC "Hot Spot" Removal, Three On-Site Corrective Action Management Units with Asphalt Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring.

See Section 5 of the FS for a description of this alternative.

Support Team: Weiss Staff
References: RACER 2010 System Costs Database

Estimate Documentation Report

Estimated Costs:

Phase Names	Direct Cost	Marked-up Cost
Biological Survey	$34,759	$86,304
Data Gap Investigation	$84,226	$157,394
Decontamination Facilities	$263,219	$582,436
Institutional Controls	$445,672	$1,039,283
Building D&D	$212,542	$314,966
Elderberry Mitigation	$270,000	$270,000
Clearing and Grubbing	$28,374	$52,025
Decommission GW Monitoring Wells	$440,895	$624,402
ET VOC "Hot Spot" Excavation	$112,789	$181,700
LFU-1 Drainage Area Excavation	$376,788	$609,893
LFU-3 Drainage Area Excavation	$166,453	$269,681
Materials Management	$637,106	$1,078,201
Demolish LFU-3 N-S Drainage Channel	$3,354	$5,026
ET PTW and Exploratory Trench Excavation	$77,737	$118,150
LFU-1 PTW and Exploratory Trench Excavation	$193,726	$278,207
LFU-2 VOC "Hot Spot" Excavation	$29,213	$47,289
LFU-2 PTW and Exploratory Trench Excavation	$205,478	$300,782
LFU-3 PTW and Exploratory Trench Excavation	$49,407	$71,311
Excavated Material Consolidation	$26,730	$45,243
LFU-1 Cap	$768,464	$1,250,719
LFU-2/ET/WBH Cap	$1,330,154	$2,183,121
LFU-3 Cap	$288,563	$466,033
Off-Site Transportation and Disposal	$1,987,321	$2,386,533
Install New GW Monitoring Wells	$206,121	$297,551
LFU-1 Drainage Swale	$10,442	$18,841
LFU-3 Drainage Channels	$67,839	$116,775
Storm Drainage	$440,167	$707,262
Building Reconstruction	$423,616	$423,616
Groundwater and Storm Water Monitoring	$2,799,569	$3,775,150
O&M Drainage System	$6,000	$6,000
O&M of Caps	$970,899	$1,756,705
Five-Year Reviews	$63,558	$159,250
Periodic Storm Water Lift Station Repair	$2,677	$4,012
Total Cost:	$13,023,860	$19,683,859

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Biological Survey
Description: Perform biological survey of Site prior to remedial action to assess population abundance and diversity of selected plant and animal species.

Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
RCRA Facility Investigation	Yes	100	0

Total Marked-up Cost: $86,304

Technologies:

Estimate Documentation Report

Technology Name: **RCRA Facility Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		No	n/a
Other Investigations		No	n/a
Site Distance		70	MI
Site Complexity		Low	n/a
Site Charact.			
Required Parameters			
Fieldwork Support		No	n/a
Evaluate Site Geology/Hydrogeology		No	n/a
Evaluate Site Soils/Surface Hydrology		No	n/a
Evaluate Site Meteorology		No	n/a
Evaluate Populations and Land Usage		No	n/a
Evaluate Site Ecology		Yes	n/a
Evaluate Nature and Extent of Contamination		No	n/a
Evaluate Contaminant Fate and Transport		No	n/a
Conduct Baseline Risk Assessment		No	n/a
Compose RFI Report		Yes	n/a

Comments: On-Site biological survey with particular emphasis on threatened and endangered species prior to commencement of any remedial activities.

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Data Gap Investigation
Description: Pre-remedial action characterization study to be conducted in the Southern Trenches and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two samples per ten-foot length of the trench plus two end-sidewall samples and additional QA/QC samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY	Yes	5	95
Site Inspection	Yes	100	0

Total Marked-up Cost: $157,394

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey investigation trenches. Registered surveyor report. Assume surveying completed in one day after completion of all trenches.

Estimate Documentation Report

Technology Name: **Site Inspection (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Planning		Yes	n/a
Site Investigation		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		Yes	n/a
Site Distance		70	MI
Site Complexity		Moderate	n/a
Planning			
Required Parameters			
Data Review		Yes	n/a
SI Work Plan		Yes	n/a
SI Supplemental Plans (Health and Safety,		Yes	n/a
Site Investigation			
Required Parameters			
Provide Fieldwork Support		Yes	n/a
Data Validation		Yes	n/a
Compose SI Report		Yes	n/a
Complete Revised HRS Scoring Package		Yes	n/a
Implement Community Relations		Yes	n/a
S&A			
Required Parameters			
Bioassays		No	n/a
Crew Size		2 Field Technicians	n/a
Include QA/QC Samples		Yes	n/a
Groundwater		No	n/a
Surface Water		No	n/a
Sampling - Water: Primary Analytical Template		None	n/a
Sampling - Water: Secondary Analytical Template		None	n/a
Surface Soil		No	n/a
Subsurface Soil		Yes	n/a
Sediment		No	n/a
Sampling - Soil/Sediment: Primary Analytical Template		System Soil - Low Level Radioactive	n/a

Estimate Documentation Report

Technology Name: **Site Inspection (# 1)**

Description	*Default*	*Value*	*UOM*
S&A			
Required Parameters			
Sampling - Soil/Sediment: Secondary Analytical Template		None	n/a
Air		No	n/a
Soil Gas		No	n/a
Sampling - Air/Soil Gas: Primary Analytical Template		None	n/a
Sampling - Air/Soil Gas: Secondary Analytical Template		None	n/a
Media			
Required Parameters			
Subsurface Soil: Avg. Sample Depth		12	FT
Subsurface Soil: # Sampling Locations		8	EA
Subsurface Soil: # Samples per Location		13	EA
Subsurface Soil: # Rounds		1	EA
Methodology			
Required Parameters			
Methodology: Subsurface Soil	Power Auger	Air Rotary Rig	n/a
Methodology: Turnaround Time		Standard (21 Days)	n/a
Methodology: Quality Control		Level 4	n/a

Comments: Pre-remedial action characterization study to be conducted in the Southern Trenches and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two sample per ten-foot length of the trench plus two end-sidewall samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Institutional Controls
Description: Implement and maintain Institutional/Land Use Controls to prohibit Site development or activities incompatible with designated land use.

Approach: In Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
INITIAL LAND SURVEY	Yes	5	95
ADMINISTRATIVE LAND USE CONTROLS	Yes	100	0

Total Marked-up Cost: $1,039,283

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **INITIAL LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		INITIAL LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew to establish legal boundaries defining the Site's boundaries. Licensed surveyor report. 3 man survey crew - 5 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Rename Model		ADMINISTRATIVE LAND USE CONTROLS	n/a
Planning Documents		Yes	n/a
Planning Documents: Start Date		2010	n/a
Implementation		Yes	n/a
Implementation: Start Date		2010	n/a
Monitoring & Enforcement		Yes	n/a
Monitoring & Enforcement: Start Date		2010	n/a
Modification/Termination		No	n/a
Type of Site		Former Government Site	n/a
Planning Documents			
Required Parameters			
LUC Assurance Plan (LUCAP)		Yes	n/a
LUC Assurance Plan (LUCAP): Plan Complexity		Medium	n/a
LUC Implementation Plan (LUCIP)		Yes	n/a
LUC Implementation Plan (LUCIP): Number		1	EA
LUC Implementation Plan (LUCIP): Plan Complexity		Medium	n/a
Long-term Stewardship (LTS) Plan		No	n/a
Memorandum of Agreements (MOA)		No	n/a
Installation (or City) Master Plan		No	n/a
Construction Permitting		Yes	n/a
Construction Permitting: Number		1	EA
Construction Permitting: Plan Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Plan Complexity		Low	n/a
Planning Meetings			
Required Parameters			
LUCAP: Number of Meetings		2	EA
LUCAP: Number of People		2	EA

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Planning Meetings			
Required Parameters			
LUCAP: Number of Days		1	EA
LUCAP: Airfare Cost		0	$
LUCAP: Mileage to Meeting Site		70	MI
LUCIP: Number of Meetings		2	EA
LUCIP: Number of People		2	EA
LUCIP: Number of Days		1	EA
LUCIP: Airfare Cost		0	$
LUCIP: Mileage to Meeting Site		70	MI
Construction Permitting: Number of Meetings		1	EA
Construction Permitting: Number of People		1	EA
Construction Permitting: Number of Days		1	EA
Construction Permitting: Airfare Cost		0	$
Construction Permitting: Mileage to Meeting Site		70	MI
GIS/Overlay Maps: Number of Meetings		1	EA
GIS/Overlay Maps: Number of People		1	EA
GIS/Overlay Maps: Number of Days		1	EA
GIS/Overlay Maps: Airfare Cost		0	$
GIS/Overlay Maps: Mileage to Meeting Site		70	MI
Implementation			
Required Parameters			
Modify Installation (or City) Master Plan		No	n/a
Deed Notification		Yes	n/a
Deed Notification: Number		1	EA
Deed Notification: Task Complexity		Low	n/a
Negotiating Easements		No	n/a
Restrictive Covenants		Yes	n/a
Restrictive Covenants: Number		1	EA
Restrictive Covenants: Task Complexity		Low	n/a
Equitable Servitudes		No	n/a
Access Control Signs		Yes	n/a

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Implementation			
Required Parameters			
Access Control Signs: Number		22	EA
Access Control Signs: Task Complexity		Low	n/a
Utility Notification Service		Yes	n/a
Access Control Signs: Number		1	EA
Access Control Signs: Task Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Task Complexity		Low	n/a
Develop Finding of Suitability to Transfer (FOST)		No	n/a
Monitoring & Enforcement			
Required Parameters			
Duration of Monitoring/Enforcement		31	Years
Notice Letters		No	n/a
Guard Service/Security		No	n/a
Reports & Certifications		Yes	n/a
Reports & Certifications: Frequency		Annually	n/a
Site Visits/Inspections		Yes	n/a
Site Visits/Inspections: Number		1	EA
Site Visits/Inspections: Safety Level		D	n/a
Site Visits/Inspections: Duration		1	Days
Site Visits/Inspections: Number of People		2	EA
Site Visits/Inspections: Frequency		Annually	n/a
Site Visits/Inspections: Airfare		0	$ Per Ticket
Site Visits/Inspections: Mileage		70	MI

Comments: Implement and maintain land use controls to prohibit Site development or activities incompatible with designated land use.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decontamination Facilities
Description: Provide decontamination facilities for equipment and personnel throughout duration of the remedial action.

Approach: Ex Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Decontamination Facilities	Yes	100	0

Total Marked-up Cost: $582,436

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		554,701	$
Percentage	19	5	%
Dollar Amount		27,735	$

Comments:

Estimate Documentation Report

Technology Name: **Decontamination Facilities (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
New Decontamination Facility Pad Construction		No	n/a
Equipment Rating		n/a	n/a
Equipment Decontamination Operations		Yes	n/a
Equipment Decontamination Operations: Duration		36	weeks
Personnel Decontamination Trailers		Yes	n/a
Personnel Decontamination Trailers: Average Crew Size		10	per shift
Personnel Decontamination Trailers: Duration		36	weeks
Safety Level		D	n/a
Work Shifts			
Secondary Parameters			
Equipment Decontamination		One Shift per Day	n/a
Personnel Decontamination		One Shift per Day	n/a

Comments: Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 36 weeks.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building D&D
Description: Prior to implementation of the alternative, nine Site buildings will be demolished and associated hazardous demolition material will be disposed off-Site. It is assumed that five percent of the demolition waste is contaminated with asbestos, lead, and PCBs. Non-hazardous building material will be recycled or disposed of in an on-Site CAMU. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated.
Apply 15% contingency for worker safety and additional waste volume.

Approach: Ex Situ
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Professional Labor Management	Yes	100	0
D&D, Sampling and Analysis	Yes	100	0

Total Marked-up Cost: $314,966

Technologies:

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		630	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		33.25	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		1.75	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		1,200	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		63.65	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		3.35	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose storage building (H-253) near northwest corner of Landfill No. 3. Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		191,492	$
Percentage	19.8	19.8	%
Dollar Amount		37,915	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Mobilizations		1	EA
Mobilization Distance		70	MI (One-way)
Soil/Sediment: # of Samples		0	EA
Soil/Sediment: Survey Area		0	SF
Water/Liquid: # of Samples		0	EA
Water/Liquid: Survey Area		0	SF
Building Surfaces: # of Samples		141	EA
Building Surfaces: Survey Area		43,287	SF
Sampling Rate		75	Per Day
Sampling Crew Size		2 Radiation Technicians, 1 Health and Safety Officer	n/a
Safety Level		D	n/a
Laboratory Analyses			
Required Parameters			
Soil: Alpha		No	n/a
Soil: Beta		No	n/a
Soil: Gamma		No	n/a
Soil: VOC"s		No	n/a
Soil: SVOC"s		No	n/a
Soil: Fuels		No	n/a
Soil: Pesticides		No	n/a
Soil: PCB"s		No	n/a
Soil: Metals		No	n/a
Soil: Acids/Caustics		No	n/a
Soil: Ordnance Residual		No	n/a
Water: Alpha		No	n/a
Water: Beta		No	n/a
Water: Gamma		No	n/a
Water: VOC"s		No	n/a
Water: SVOC"s		No	n/a

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Laboratory Analyses			
Required Parameters			
Water: Fuels		No	n/a
Water: Pesticides		No	n/a
Water: PCB"s		No	n/a
Water: Metals		No	n/a
Water: Acids/Caustics		No	n/a
Water: Ordnance Residual		No	n/a
Building: Alpha		No	n/a
Building: Beta		No	n/a
Building: Gamma		No	n/a
Building: VOC"s		No	n/a
Building: SVOC"s		No	n/a
Building: Fuels		No	n/a
Building: Pesticides		No	n/a
Building: PCB"s		Yes	n/a
Building: Metals		Yes	n/a
Building: Acids/Caustics		No	n/a
Building: Ordnance Residual		No	n/a
QA Blanks: Soil/Sediment		0	%
QA Blanks: Water/Liquid		0	%
QA Blanks: Building		15	%
Hand Scanning		1	Days
Adjustments/Productivity			
Secondary Parameters			
Turnaround Time		Standard (21 Days)	n/a
Quality Control		Level 1	n/a
Height Adjustment	15	15	%
Protective Clothing	23	23	%
RADCON	15	15	%
Respiratory Protection	38	38	%
Breaks	10	10	%

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Adjustments/Productivity			
Secondary Parameters			
Productivity Loss Multiplier	2.32	n/a	n/a

Comments: Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. One sample per ~300 ft2. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals. At two Geriartics Buildings H-292 and H-293, include radiological analyses.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Elderberry Mitigation
Description: Identify elderberry shrub clusters within work boundaries and relocate them within UC boundaries.

Approach: None
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ELDERBERRY SHRUB CLUSTER RELOCATION	No	0	0

Total Marked-up Cost: $270,000

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **ELDERBERRY SHRUB CLUSTER RELOCATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ELDERBERRY SHRUB CLUSTER RELOCATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.02	n/a
Safety Level		D	n/a

Comments: Cost for Elderberry mitigation based on previous transplanting operations at UC Davis.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Area Excavation
Description: Excavate LFU-1 Drainage Area. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean fill. Revegetate surface. Load and haul soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $609,893

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		491,228	$
Percentage	19.2	19.2	%
Dollar Amount		94,316	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		7,215	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	14	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	41	41	EA
Number of Composites Submitted to Lab	11	11	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 1 Drainage Area.
Collect default number of confirmation samples.
Backfill and compact with clean fill. Revegetate surface, a drainage swale will be constructed in this area after excavation..

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		3,839	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavated material to stockpiling areas. Assume stockpile area is immediately adjacent to LFU-3 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Materials Management
Description: Excavated material will be handled in accordance with a Materials Management Plan. Materials Management includes the cost of storage/stockpiling, sorting of waste streams, waste characterization, and staging for final disposal. Disposal is handled in a separate cost element. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Drum Staging	Yes	20	80
LOADER FOR STAGING AREA	Yes	0	100
WASTE CHARACTERIZATION SAMPLING	Yes	100	0
Professional Labor Management	Yes	80	20
Bulk Material Storage	Yes	20	80
Bulk Material Storage	Yes	20	80
SIFTING OF EXCAVATED MATERIAL	Yes	20	80

Total Marked-up Cost: $1,078,201

Technologies:

Estimate Documentation Report

Technology Name: **Drum Staging (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Waste		Solid	n/a
Solid: To be Staged		38	EA
Solid: Leaking/Damaged Requiring Overpacks		0	EA
Solid: To be Sampled		38	EA
Solid: Second Sample per Drum		No	n/a
Temporary Staging Area		438	SF
Drums to be Consolidated (Drums to Bulk)		38	EA
Drum Average Percentage Full		65	%
Safety Level		C	n/a
Handling			
Secondary Parameters			
Overpacks		85 Gal. Steel Salvage Drum	n/a
First Sample Analysis: Liquid		Waste Characterization, Liquid	n/a
First Sample Analysis: Solid / Sludge		Waste Characterization, Solids	n/a
Second Sample Analysis: Liquid		None	n/a
Second Sample Analysis: Solid / Sludge		None	n/a
Storage			
Secondary Parameters			
Liner/Temporary Staging Area	60 Mil Polymeric Liner, HDPE	60 Mil Polymeric Liner, HDPE	n/a
Drum Storage Systems: Quantity	0	0	EA
Drum Storage Systems: Type	Poly Spill Pallet, 4 Drum Cap	Poly Spill Pallet, 4 Drum Cap	n/a
Containment Berms: Quantity	0	0	EA
Containment Berms: Type	10" x 10" x 17", 750 Gallon	10" x 10" x 17", 750 Gallon	n/a

Comments: Drums for principal threat wastes/lab packs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LOADER FOR STAGING AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LOADER FOR STAGING AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled dirt needs to be moved around. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

Technology Name: **User Defined Estimate (# 2)**
User Name: **WASTE CHARACTERIZATION SAMPLING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WASTE CHARACTERIZATION SAMPLING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.06	n/a
Safety Level		D	n/a

Comments: Assume the included materials and analyses for waste characterization prior to final disposal of PTW and VOC "Hot Spot" TEV.
Assume 1 sample per 300 CY for costing purposes only. Actual sampling rate will be considered during remedial design.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		363,691	$
Percentage	19.4	19.4	%
Dollar Amount		70,556	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Bulk Material Storage (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Roll-Off/Bulk Containers/Tanks	n/a
Quantity of Material		150	CY
Safety Level		C	n/a
Secondary			
Secondary Parameters			
Size	30 CY Open Top Roll-Off Container	30 CY Open Top Roll-Off Container	n/a
Quantity	6	6	n/a

Comments: Bulk containers for PTW.

Estimate Documentation Report

Technology Name: **Bulk Material Storage (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Soil Bermed Storage Area	n/a
Quantity of Material		19,882	CY
Safety Level		D	n/a
Secondary			
Secondary Parameters			
Storage Area Quantity	1	1	EA
Storage Area Length	213	213	FT
Storage Area Width	213	213	FT
Berm Height	2	2	FT
Berm Top Width	2	2	FT
Slope: Feet Run / 1 Foot Rise	3	3	FT
Polymeric Liner Material	40 Mil Polymeric Liner, PVC	40 Mil Polymeric Liner, PVC	n\a
Polymeric Liner Quantity	1	1	EA
Soil Liner Material	None	None	n/a
Soil Liner Thickness	0	0	IN
Liner Protection Layer Material	Gravel	Gravel	n/a
Liner Protection Layer Thickness	12	12	IN

Comments: Stockpile TEV.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **SIFTING OF EXCAVATED MATERIAL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		SIFTING OF EXCAVATED MATERIAL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.90	n/a
Safety Level		C	n/a

Comments: Sorting of excavated material to segregate principal threat wastes. Assume the use of similar equipment used under the MEC Sifting assembly. Assume rate of sorting is approximately 200 CY/day.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Clearing and Grubbing
Description: Clear and grub areas to be excavated and/or capped.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80

Total Marked-up Cost: $52,025

Technologies:

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		2.42	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		424.830993652344	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 1 footprint.
Current satellite photo and photographs from recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume grubbed material will be kept on-site for re-use.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		3.48	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		610.914001464844	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 2/Eastern Trenches/Waste Burial Holes footprint.
Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume chipping and stockpiling is done on-site.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		1.01	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		177.30549621582	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear trees and vegetation at Landfill Unit 3. Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range. Assume grubbed material is stored and re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decommission GW Monitoring Wells
Description: Decommission groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Well Abandonment	Yes	20	80
Professional Labor Management	Yes	100	0
Residual Waste Management	Yes	80	20

Total Marked-up Cost: $624,402

Technologies:

Estimate Documentation Report

Technology Name: **Well Abandonment (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Abandon Wells			
Required Parameters			
Technology/Group Name		TP-1 through TP-5	n/a
Number of Wells		5	EA
Well Depth		81	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-1 Wells	n/a
Number of Wells		6	EA
Well Depth		64	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-2 Well	n/a
Number of Wells		1	EA
Well Depth		86	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		DDC Wells	n/a
Number of Wells		3	EA
Well Depth		85	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a

Comments: Decommission wells in accordance with Table 5-3.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		594,669	$
Percentage	19	5	%
Dollar Amount		29,733	$

Comments:

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		41	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET VOC "Hot Spot" Excavation
Description: Excavate ET VOC "Hot Spot." Apply 15% contingency for radiological work and backfill requirements.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Excavation	Yes	5	95

Total Marked-up Cost: $181,700

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,686	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		140,413	$
Percentage	19.9	19.9	%
Dollar Amount		27,942	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		713	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	58	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	6	6	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate the ET VOC "Hot Spot," East to a depth of 20 feet bgs. Backfill with clean fill.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		492	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	63	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate ET VOC "Hot Spot," West.

Excavation to be backfilled and compacted with Site consolidated soil/solid waste.
Level C PPE assumed because of potential VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Drainage Area Excavation
Description: Excavate LFU-3 Drainage Area. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean import soil. Revegetate surface. Load and haul Landfill Unit 3 soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $269,681

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		204,956	$
Percentage	19.7	19.7	%
Dollar Amount		40,376	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		2,742	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	20	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	18	18	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 3 waste cells.
Collect default number of confirmation samples.
Backfill and compact with clean import soil. Revegetate surface.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		3,839	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavated material to stockpiling areas. Assume stockpile area is immediately adjacent to LFU-3 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added excavation volume, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $118,150

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	67	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET Trench 24 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		12	CY
Depth		7	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	69	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET Trench 26 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		61	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	55	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET TRL-45 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		57	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	64	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: ET TRL-48 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		18	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	59	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	5	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T1 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	6	EA
Number of Composites Submitted to Lab	5	6	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T2 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	6	EA
Number of Composites Submitted to Lab	5	6	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T3 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		21	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	6	EA
Number of Composites Submitted to Lab	5	6	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: ET-T4 PTW excavation.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		86,528	$
Percentage	20	20	%
Dollar Amount		17,306	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		324	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		0.5	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added excavation volume, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $278,207

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		83	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	51	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	13	EA
Number of Composites Submitted to Lab	5	13	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T6 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		80	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	51	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	13	EA
Number of Composites Submitted to Lab	5	13	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T7 PTW excavation

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		210,234	$
Percentage	19.7	19.7	%
Dollar Amount		41,416	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		838	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		137	CY
Depth		7	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	40	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-35 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		55	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	45	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-36 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		38	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T1 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		40	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T2 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		41	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T3 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		57	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	56	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	10	EA
Number of Composites Submitted to Lab	5	10	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T4 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		69	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	53	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	11	EA
Number of Composites Submitted to Lab	5	11	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T5 PTW excavation

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		2.4	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added volume of excavation, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $300,782

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		132	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	15	EA
Number of Composites Submitted to Lab	5	15	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T3 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		132	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	15	EA
Number of Composites Submitted to Lab	5	15	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T4 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		228,564	$
Percentage	19.7	19.7	%
Dollar Amount		45,027	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		953	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		11	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	74	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-2 TRL-12 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		48	CY
Depth		15	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	78	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-22 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		11	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	65	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-2 TRL-20 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		174	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	54	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	19	EA
Number of Composites Submitted to Lab	5	19	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T1 excavation. Collect soil/solid waste samples.

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		174	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	54	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	19	EA
Number of Composites Submitted to Lab	5	19	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T2 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		2.2	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 PTW and Exploratory Trench Excavation
Description: Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added volume of excavation, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $71,311

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		40	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU3-T1 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		44	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	59	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	8	EA
Number of Composites Submitted to Lab	5	8	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU3-T2 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		46,193	$
Percentage	20.1	20.1	%
Dollar Amount		9,285	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		117	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		1	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Demolish LFU-3 N-S Drainage Channel
Description: The concrete lined drainage channel which partially overlays LFU-3 will be removed.
New N-S drainage channels will be re-constructed post-remediation.
This cost estimate assumes that a termporary drainage channel will not have to be created since the remedial action will take place in the dry season.

Approach: Ex Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
DEMOLISH LFU3 N-S DRAINAGE CHANNEL	Yes	100	0

Total Marked-up Cost: $5,026

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **DEMOLISH LFU3 N-S DRAINAGE CHANNEL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DEMOLISH LFU3 N-S DRAINAGE CHANNEL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.01	n/a
Safety Level		D	n/a

Comments: Demolish gunnite lined north-south drainage channel overlaying Landfill Unit 3 in area where waste cells lie adjacent to channel. Assume thickness of gunnite lining = 2inches, length of channel is 270 feet, top width of channel is 30 feet, base width of channel is 16 feet, depth of channel is 7 feet. Assume 160 feet of the channel will need to be demolished. The channel will be demolished to remove underlying waste. The channel will be restored in its original location. Demolished concrete will be re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 VOC "Hot Spot" Excavation
Description: Excavate LFU-2 VOC "Hot Spot." Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $47,289

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,210	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	52	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate the LFU-2 VOC "Hot Spot" to a depth of 20 feet bgs.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,693	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul LFU-2 VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		28,263	$
Percentage	20.1	20.1	%
Dollar Amount		5,681	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Excavated Material Consolidation
Description: Consolidate non-PTW excavated material from excavations in on-Site CAMUs. 10% contingency applied for consolidation of additional volume.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
CONSOLIDATE WASTE IN LFU-1 CAMU	Yes	5	95
CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU	Yes	5	95
CONSOLIDATE WASTE IN LFU-3 CAMU	Yes	5	95

Total Marked-up Cost: $45,243

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **CONSOLIDATE WASTE IN LFU-1 CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LFU-1 CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in LFU-1 CAMU.

Technology Name: **User Defined Estimate (# 2)**
User Name: **CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in LFU-2/ET/WBH CAMU.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **CONSOLIDATE WASTE IN LFU-3 CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LFU-3 CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in LFU-3 CAMU.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2/ET/WBH Cap
Description: Install an asphalt capover the footprint of LFU-2, ETs and WBHs. Assumes 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF ASPHALT COVER	Yes	5	95
Off-site Transportation and Waste Disposal	Yes	5	95
GRADE AROUND ASPHALT COVER TO PROMOTE DRAINAGE	Yes	5	95
Capping	Yes	20	80
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $2,183,121

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF ASPHALT COVER**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF ASPHALT COVER	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foudation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetatitve cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 x 1/2 day. Licensed surveyor report.

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		5	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-2/ET/WBH asphalt cover construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **GRADE AROUND ASPHALT COVER TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND ASPHALT COVER TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around asphalt cover to promote drainage.

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		Dermal Cover	n/a
Acres		3.5	AC
Length		552	FT
Width		276	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	69	138	FT
Horizontal Projection of Top Slope	69	0	FT
Dermal Cover			
Secondary Parameters			
Top Cover Type	Vegetation	Asphalt Paving	n/a
Soil Cover Thickness	3	3	IN
Soil Cover Borrow Source	Off-site	Off-site	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a

Comments: Asphalt cap constructed for LFU-2/ET/WBH.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		1,866,169	$
Percentage	16.4	16.4	%
Dollar Amount		306,052	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Cap
Description: Install asphalt cap over LFU-1. Dispose non-hazardous waste generaged by construction activities. Grade cap and surrounding area to promote drainage into storm drain. Survey boundaries of completed cap. Add non-PTW excavated from LFU-1 drainage area to capped area. 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
GRADE AROUND ASPHALT COVER TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Off-site Transportation and Waste Disposal	Yes	5	95
LAND SURVEY OF ASPHALT COVER	Yes	5	95
Capping	Yes	20	80

Total Marked-up Cost: $1,250,719

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **GRADE AROUND ASPHALT COVER TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND ASPHALT COVER TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around LFU-1 to promote drainage into constructed storm drain.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		1,050,693	$
Percentage	18	18	%
Dollar Amount		189,125	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		5	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-1 cap construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF ASPHALT COVER**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF ASPHALT COVER	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Licensed surveyor report. 3 man survey crew - 4 x 1/2 day. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		Dermal Cover	n/a
Acres		2	AC
Length		417	FT
Width		209	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	52	52	FT
Horizontal Projection of Top Slope	52	52	FT
Dermal Cover			
Secondary Parameters			
Top Cover Type	Vegetation	Asphalt Paving	n/a
Soil Cover Thickness	3	3	IN
Soil Cover Borrow Source	Off-site	Off-site	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a

Comments: Install asphalt cap over LFU-1.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Off-Site Transportation and Disposal
Description: Transport and dispose of RCRA hazardous, mixed waste, Non-RCRA hazardous, LLRW, and non-hazardous waste material generated by Site remedial excavations. Hazardous wastes will be transported to Class I hazardous waste facility; solid LLRW and mixed waste to LLRW accepting facility; and non-hazardous materials at Class II non-hazardous landfill. Assume drummed PTW will be sent to the LLRW accepting facility, and biological waste will be incinerated.

Approach: Ex Situ
Start Date: September, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0

Total Marked-up Cost: $2,386,533

Technologies:

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Non-leaking Drums	n/a
Quantity of Non-Leaking Drums		38	Drums
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dipose of drums containing PTW requiring stabilization. Assume default acceptance and treatment fee. Assume 594 mile transport distance.

Technology Name: **Off-site Transportation and Waste Disposal (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Low-Level Radioactive Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		1,339	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose LLRW. Assume $1,080/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Mixed Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		75	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose mixed waste. Assume $2,814/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		780	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose RCRA hazardous waste. Assume $170/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		276	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose non-RCRA hazardous waste. Assume $85/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Cap
Description: Install asphalt cap over LFU-3. The existing N-S and E-W drainage channels will need to be removed in areas to allow for the cap construction. New concrete lined drainage channels will be constructed beyond cap boundaries (handled in another cost element). Dispose non-hazardous waste generaged by construction activities. Grade cap and surrounding area to promote drainage into storm drainage channel. Survey boundaries of completed cap.

Approach: In Situ
Start Date: September, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF ASPHALT COVER	Yes	5	95
Capping	Yes	20	80
GRADE AROUND ASPHALT COVER TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Off-site Transportation and Waste Disposal	Yes	5	95

Total Marked-up Cost: $466,033

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF ASPHALT COVER**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF ASPHALT COVER	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Licensed surveyor report. 3 man survey crew - 4 x 1/2 day. Licensed surveyor report.

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		Dermal Cover	n/a
Acres		0.71	AC
Length		249	FT
Width		124	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	31	62	FT
Horizontal Projection of Top Slope	31	0	FT
Dermal Cover			
Secondary Parameters			
Top Cover Type	Vegetation	Asphalt Paving	n/a
Soil Cover Thickness	3	3	IN
Soil Cover Borrow Source	Off-site	Off-site	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a

Comments: Install asphalt cap over Landfill Unit 3. Grade LFU-3 area to a minimum 1.5% slope. Total area of Landfill Unit 3 to be capped is assumed to cover 0.71 acre.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **GRADE AROUND ASPHALT COVER TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND ASPHALT COVER TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around LFU-3 to promote drainage into constructed storm drain channels to the east and south of the LFU-3 cap.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		385,666	$
Percentage	19.4	19.4	%
Dollar Amount		74,819	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		10	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-3 cap construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Drainage Channels
Description: The concrete lined drainage channel which partially overlays LFU-3, will be reconstructed post-remediation.
The E-W LFU-3 drainage channel will also be reconstructed south of its original location.

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
N-S DRAINAGE CHANNEL CONSTRUCTION	Yes	20	80
E-W DITCH CONSTRUCTION	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $116,775

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **N-S DRAINAGE CHANNEL CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		N-S DRAINAGE CHANNEL CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Reconstruction of north-south, drainage ditch. Assume 160 feet need to be restored with concrete lining.

Technology Name: **User Defined Estimate (# 2)**
User Name: **E-W DITCH CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		E-W DITCH CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Construction of new east-west drainage ditch at LFU-3, south of its original location. Assume 260 feet needed. This drainage ditch currently drains the Raptor Center and vicinity. It will discharge into the larger N-S concrete lined drainage ditch.

Technology Name: **User Defined Estimate (# 3)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage channels. 2 x 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Storm Drainage
Description: Install storm drainage controls for the lined and capped CAMU. Drainage piping will be added to the perimeter of the CAMU which will discharge runoff into a detention basin. The detention basin will discharge to either the LFU-1 discharge point or the LFU-3 north-south concrete lined drainage channel depending on the basin's location.

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY	Yes	5	95
STORM WATER DETENTION BASIN	Yes	20	80
Excavation	Yes	5	95
STORM WATER DETENTION BASIN	Yes	20	80
Excavation	Yes	5	95

Total Marked-up Cost: $707,262

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage control system. 1/2 day. Registered surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **STORM WATER DETENTION BASIN**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		STORM WATER DETENTION BASIN	n/a
WBS Type		HTRW	n/a
Selected WBS		331.09.07	n/a
Safety Level		D	n/a

Comments: Install detention basin to receive runoff from the capped LFU-1 and LFU-2/ET/WBH CAMUs.

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		3,021	CY
Depth		9	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	17	65	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate detention basin serving LFU-1 and LFU-2/ET/WBH CAMUs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **STORM WATER DETENTION BASIN**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		STORM WATER DETENTION BASIN	n/a
WBS Type		HTRW	n/a
Selected WBS		331.09.07	n/a
Safety Level		D	n/a

Comments: Install detention basin to receive runoff from the LFU-3 capped CAMU.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		622	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	28	79	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate detention basin at LFU-3.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Swale
Description: Install a north-south trending unlined storm drainage channel in LFU-1 drainage area (assume 380 ft).

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LFU-1 DRAINAGE SWALE	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $18,841

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LFU-1 DRAINAGE SWALE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LFU-1 DRAINAGE SWALE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: North-south trending unlined storm drainage channel will be constructed in LFU-1 drainage area (assume 380 ft).

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage improvements. 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Install New GW Monitoring Wells
Description: Install, develop, and survey new groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Groundwater Monitoring Well	Yes	40	60
Residual Waste Management	Yes	80	20
LAND SURVEY	Yes	5	95
Professional Labor Management	Yes	80	20
WELL DEVELOPMENT	Yes	40	60
DDC WELL AND PIEZOMETER INSTALLATION	Yes	100	0

Total Marked-up Cost: $297,551

Technologies:

Estimate Documentation Report

Technology Name: **Groundwater Monitoring Well (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Aquifers		Two	n/a
Include Guard Posts		No	n/a
Depth to Groundwater to Aquifer One		50	FT
Number of Wells to Aquifer One		9	EA
Depth to Groundwater to Aquifer Two		50	FT
Number of Wells to Aquifer Two		1	EA
Safety Level		D	n/a
Aquifer One			
Required Parameters			
Aquifer One: Average Well Depth		70	LF
Aquifer One: Formation Type		Unconsolidated	n/a
Aquifer One: Drilling Method		Hollow Stem	n/a
Aquifer One: Well Diameter		2 Inch	n/a
Aquifer One: Well Construction Material		PVC Schedule 80	n/a
Aquifer One: Split Spoon Sample Collection		Yes	n/a
Aquifer One: Average Number of Soil Samples per Well		0	EA
Aquifer One: Soil Analytical Template		None	n/a
Aquifer One: Safety Level		D	n/a
Aquifer Two			
Required Parameters			
Aquifer Two: Average Well Depth		105	LF
Aquifer Two: Formation Type		Unconsolidated	n/a
Aquifer Two: Drilling Method		Hollow Stem	n/a
Aquifer Two: Well Diameter		4 Inch	n/a
Aquifer Two: Well Construction Material		PVC Schedule 80	n/a
Aquifer Two: Split Spoon Sample Collection		Yes	n/a
Aquifer Two: Average Number of Soil Samples per Well		0	EA
Aquifer Two: Soil Analytical Template		None	n/a
Aquifer Two: Safety Level		D	n/a

Comments: Install new wells according to Table 5-3.

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		10	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey newly installed groundwater monitoring wells. Registered surveyor report. 0.5 day

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		121,933	$
Percentage	19.9	5	%
Dollar Amount		6,097	$

Comments:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **WELL DEVELOPMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WELL DEVELOPMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.01	n/a
Safety Level		D	n/a

Comments: Rent equipment for well develoment for 1 week. One equipment operator and one supervising engineer/geologist.

Technology Name: **User Defined Estimate (# 4)**
User Name: **DDC WELL AND PIEZOMETER INSTALLATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DDC WELL AND PIEZOMETER INSTALLATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.90	n/a
Safety Level		D	n/a

Comments: Installation cost of 3 density-driven convection wells and 3 sets of nested piezometers (each nest containing 3 piezometers) as replacements for those decommissioned in the ET North.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building Reconstruction
Description: Replace buildings H-253, H-290, H-292, and H-293 with three new buildings during site restoration. The two Geriatrics buildings will be reconstructed. The LFU-3 storage building and Cobalt-60 Annex will replaced with one building equal in area to the two combined. The X buildings will not be replaced.

Approach: Ex Situ
Start Date: November, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0

Total Marked-up Cost: $423,616

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-292 (Geriatrics Building No. 1)

Technology Name: **User Defined Estimate (# 2)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-293 (Geriatrics Building No. 2)

Technology Name: **User Defined Estimate (# 3)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace buildings H-253 and H-290 with one builing equivalen in square footage.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 4)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Add 20% contingency to cost of building reconstruction.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Groundwater and Storm Water Monitoring
Description: Groundwater monitoring and storm water monitoring for lifetime of alternative until cleanup objectives are met. Sample collection, analysis, data validation, data import and monitoring reports.

Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
MONITORING	Yes	100	0

Total Marked-up Cost: $3,775,150

Technologies:

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		MONITORING	n/a
Groundwater		Yes	n/a
Surface Soil		No	n/a
Surface Water		Yes	n/a
Subsurface Soil		No	n/a
Sediment		No	n/a
Soil Gas		No	n/a
Air		No	n/a
Site Distance (One-way)		70	MI
Safety Level		D	n/a
Groundwater			
Required Parameters			
Average Sample Depth		50	FT
Samples per Event (First Year)		16	n/a
Samples per Event (Out Years)		16	n/a
Number of Events (First Year)		4	n/a
Number of Events (Out Years)		1	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	System Water - Low Level Radioactive	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Sampling Method	Existing Wells - Low Flow Pump	Existing Wells - Low Flow Pump	n/a
Number of Wells/Day	8	8	EA
Contain Purge Water	Yes	Yes	n/a
Surface Water			
Required Parameters			
Average Sample Depth		0	FT

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
Surface Water			
Required Parameters			
Samples per Event (First Year)		3	n/a
Samples per Event (Out Years)		3	n/a
Number of Events (First Year)		2	n/a
Number of Events (Out Years)		2	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	None	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Number of Samples/Day	8	8	EA
QA/QC			
Secondary Parameters			
Split Samples	1: 10	1: 10	EA
Field Duplicate Samples	1: 10	1: 10	EA
Rinse Blanks (per Round)	1	1	EA
Trip Blanks (per Day)	1	1	EA
Matrix Spikes/Matrix Spike Duplicates	1: 20	1: 20	EA
Data Management			
Secondary Parameters			
Monitoring Plan	Standard	Standard	n/a
Lab Data Review	Stage 2b	Stage 2b	n/a
Submit Data Electronically	Yes	Yes	n/a
Monitoring Reports	Abbreviated	Abbreviated	n/a

Comments: Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the capped areas. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, Semivolatile organic compounds (1,4-dioxane by single ion monitoring) Cam 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. Includes data validation, electronic data import, data management and monitoring reports.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M Drainage System
Description: Annual O&M of constructed storm water drainage control infrastructure.

Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	No	0	0

Total Marked-up Cost: $6,000

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	n/a
WBS Type		HTRW	n/a
Selected WBS		342.05.08	n/a
Safety Level		D	n/a

Comments: Assume annual maintenance costs of $6,000/year for lifetime of drainage system. Includes lined/capped CAMU detention basin, LFU-1 drainage swale, LFU-3 drainage channels. Present value cost for annual O&M of drainage channels. (Cost for this element expressed as annual cost only)

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M of Caps
Description: Operations and maintenance of asphalt capped areas.

Start Date: August, 2012
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Operations and Maintenance	Yes	40	60

Total Marked-up Cost: $1,756,705

Technologies:

Technology Name: **Operations and Maintenance**

Description	*Default*	*Value*	*UOM*
Labor			
Secondary Parameters			
Operations Labor: Type	Exclude from Estimate	Minimum	n/a
Professional Labor: Type	Exclude from Estimate	Minimum	n/a

Comments: Inspect, survey and repair CAMU asphalt cap for lifetime of alternative.

Estimate Documentation Report

Technology Name: **Capping (# 1) - (O&M Parameters)**

Description	*Default*	*Value*	*UOM*
O&M Parameters			
Type of Cap		Dermal Cover	n/a
Acres		6	AC
Top Cover Type		Asphalt Paving	n/a

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Five-Year Reviews
Description: Five-Year Reviews for all technologies and controls implemented.

Start Date: March, 2015
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Five-Year Review	Yes	100	0

Total Marked-up Cost: $159,250

Technologies:

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Site Complexity		Low	n/a
Document Review		Yes	n/a
Interviews		Yes	n/a
Site Inspection		Yes	n/a
Report		Yes	n/a
Travel		No	n/a
Rebound Study		No	n/a
Start Date		March-2015	n/a
No. Reviews		6	EA
Document Review			
Required Parameters			
5-Year Review Check List		Yes	n/a
Record of Decision		Yes	n/a
Remedial Action Design & Construction		Yes	n/a
Close-Out Report		Yes	n/a
Operations & Maintenance Manuals & Reports		Yes	n/a
Consent Decree or Settlement Records		Yes	n/a
Groundwater Monitoring & Reports		Yes	n/a
Remedial Action Required		Yes	n/a
Previous 5-Year Review Reports		Yes	n/a
Interviews			
Required Parameters			
Current and Previous Staff Management		Yes	n/a
Community Groups		Yes	n/a
State Contacts		Yes	n/a
Local Government Contacts		Yes	n/a
Operations & Maintenance Contractors		Yes	n/a
PRPs		Yes	n/a
Remedial Design Consultant		Yes	n/a
Site Inspection			
Required Parameters			

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
Site Inspection			
Required Parameters			
General Site Inspection		Yes	n/a
Containment System Inspection		Yes	n/a
Monitoring Systems Inspection		Yes	n/a
Treatment Systems Inspection		Yes	n/a
Regulatory Compliance		Yes	n/a
Site Visit Documentation (Photos, Diagrams, etc.)		Yes	n/a
Report			
Required Parameters			
Introduction		Yes	n/a
Remedial Objectives		Yes	n/a
ARARs Review		Yes	n/a
Summary of Site Visit		Yes	n/a
Areas of Non Compliance		Yes	n/a
Technology Recommendations		Yes	n/a
Statement of Protectiveness		Yes	n/a
Next Review		Yes	n/a
Implementation Requirements		Yes	n/a

Comments: Inspect landfill areas for performance issues such as erosion, cracks, or excessive settlement. Review and update all documents associated with compliance, performance, land use controls, and monitoring results. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews every five years for the lifetime of the alternative.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Periodic Storm Water Lift Station Repair
Description: Periodic costs associated with storm water lift station every ten years.

Start Date: August, 2020
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LIFT STATION PUMP REPLACEMENT	Yes	100	0

Total Marked-up Cost: $4,012

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LIFT STATION PUMP REPLACEMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LIFT STATION PUMP REPLACEMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		342.03.90	n/a
Safety Level		D	n/a

Comments: RACER assembly 33410101 Pump & Motor Cost = $892.37 x 3 lift stations. Assume cost incurred every ten years. Express cost as the one-time payment cost (in base year dollars). Present value over time cost is calculated outside of RACER.

ATTACHMENT F-5c

ALTERNATIVE SW-5 ASSEMBLY LEVEL REPORT

See file in Appendix F Folder titled 'Attachment_F-5c_SW-5_AssemblyLevelReport.xlsx'

ATTACHMENT F-6a

ALTERNATIVE SW-6 COST ASSUMPTIONS

ALTERNATIVE SW-6 COST ASSUMPTIONS

Attachment F-6a-1. Alternative SW-6 Description

Attachment F-6a-2. Planning and Oversight

Attachment F-6a-3. Biological Survey and Elderberry Shrub Cluster Relocation

Attachment F-6a-4. Data Gaps Investigation of the Southern Trenches and Hopland Field Station Disposal Area

Attachment F-6a-5. Decontamination Facilities

Attachment F-6a-6. Building Decommissioning and Demolition, Building Sampling and Analysis

Attachment F-6a-7. Building Decommissioning and Demolition, Building Demolition and Reconstruction

Attachment F-6a-8. Groundwater Monitoring Well Decommissioning

Attachment F-6a-9. Clearing and Grubbing

Attachment F-6a-10. Demolish/Backfill LFU-3 Drainage Channels

Attachment F-6a-11. Excavation of LFU-1 Known PTW and Exploratory Trenches

Attachment F-6a-12. Excavation of LFU-2 Known PTW and Exploratory Trenches

Attachment F-6a-13. Excavation of LFU-3 Exploratory Trenches

Attachment F-6a-14. Excavation of Eastern Trenches

Attachment F-6a-15. Excavation of ET VOC “Hot Spot”

Attachment F-6a-16. Excavation of LFU-1 Drainage Area

Attachment F-6a-17. Excavation of LFU-2 VOC “Hot Spot”

Attachment F-6a-18. Excavation of LFU-3 Drainage Area

Attachment F-6a-19. Materials Management

Attachment F-6a-20. Excavated Materials Consolidation

Attachment F-6a-21. Off-Site Transportation and Disposal

Attachment F-6a-22. Install LFU-1 Multiple-layer Cap

Attachment F-6a-23. Install LFU-2/ET/WBH Multiple-layer Cap

Attachment F-6a-24. Install LFU-3 Multiple-layer Cap

Attachment F-6a-25. Install New Groundwater Monitoring Wells

Attachment F-6a-26. Storm Drainage Controls

Attachment F-6a-27. O&M: Institutional Controls

Attachment F-6a-28. O&M: Groundwater and Storm Water Monitoring

Attachment F-6a-29. O&M of Storm Water Drainage Infrastructure

Attachment F-6a-30. O&M of Multiple-layer Caps

Attachment F-6a-31. Periodic Costs: Five Year Reviews

Attachment F-6a-32. Contingent Action: Install ST and HFSDA Multiple-layer Caps

Alternative SW-6 - Hot Spot Removal, Three Multiple Layer Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring
-- See Section 5 of the FS - Volume 1 for a description of this alternative.

Alternative SW-6 Components Listed:

- Planning and oversight
- Biological Survey
- Elderberry Shrub Cluster Relocation
- Data Gap Investigation
- Decontamination Facilities
- Building Decommissioning and Demolition
  - Building Sampling
  - Building Demolition and Reconstruction
- Groundwater Well Decommissioning
- Clearing and Grubbing
- Demolish/Backfill LFU-3 Drainage Channels
- Excavation of LFU-1 Known PTW and Exploratory Trenches
- Excavation of LFU-2 Known PTW and Exploratory Trenches
- Excavation of LFU-3 Known PTW and Exploratory Trenches
- ET Excavation - ET North and ET South
- ET VOC "Hot Spot," East and West Excavation
- LFU-1 Drainage Area Excavation
- LFU-2 VOC "Hot Spot" Excavation
- LFU-3 Drainage Area Excavation
- Materials Management
- Excavated Materials Consolidation
- Off-Site Transportation and Disposal
- Install LFU-1 Multiple-Layer Cap
- Install LFU-2/ET/WBH Multiple-Layer Cap
- Install LFU-3 Multiple-Layer Cap
- Install New Groundwater Wells
- Storm Drainage Controls
  - Storm Water Collection and Conveyance System
  - Installation of extended detention basins
  - Installation of vegetated swale along eastern edge of LFU-1
  - Redirect drainage ditch south along perimeter of LFU-3
  - Reconstruct LFU-3 north-south drainage channel
- Operations and Maintenance (O&M): Institutional Controls
- O&M: Groundwater and Storm Water Monitoring
- O&M of Storm Water Drainage Infrastructure
- O&M of Caps
- Periodic Costs: Storm Water Lift Station Repair (See O&M of Storm Water Drainage Infrastructure)
- Periodic Costs: Five Year Reviews
- Contingent Action: Install ST and HFSDA Multiple-Layer Cap

Planning and Oversight

Work planning, Health and Safety, Construction Quality Assurance/Quality Control Program, Construction Site Environmental Controls, Materials Management Plan (Table 5-1)

Costs for most planning and oversight are included in RACER's "Professional Labor Management" cost sub-component and in professional labor cost assemblies.
These planning and oversight activities include:

Preparation and submittal of Contract-Required Deliverables
Preparation and submittal of project-specific planning documents (Work Plan, HASP, QAPP, materials management plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Sampling and Construction Quality Control Test Results
Health & Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Costs are estimated as a percentage of the calculated marked-up cost for a given remedial action component through "Professional Labor Management," or through professional labor assemblies included in the estimate for the remedial action cost component.

"Professional Labor Management" includes the costs of typical professional support activities associated with construction including preparation of site-specific construction activities, incidental permit acquisition, and contract-required deliverables. It also includes typical site-specific professional support activities associated with remedial action including evaluation of sampling and analysis data, comparison of results with project goals, coordination of field activities, and documentation and reporting of field activities. Each cost component has planning and oversight costs associated with it; where professional labor management is not specifically included as a cost sub-component, it is assumed that such cost estimates contain professional labor hours bundled with the cost for implementation of that cost component.

Attachment F-6a-3. Biological Survey and Elderberry Shrub Cluster Relocation - Cost Estimates, UC Davis LEHR/OCL

Biological Survey

Conduct a biological survey assessing selected plant, insect and animal species abundance, assess biotic diversity, and survey endangered/critical species' habitat.

Present findings in an biological survey report.

Elderberry Shrub Cluster Relocation

Elderberry shrub clusters located within areas potentially impacted by remediation will be relocated to the Russell Ranch Mitigation Area, as specified in the UC Davis Long Range Development Plan EIR Mitigation Measure 4.4-6(b).

Assume cost is $270,000 based on previous relocations.

Attachment F-6a-4. Data Gaps Investigation of the Southern Trenches and Hopland Field Station Disposal Area - Cost Estimates, UC Davis LEHR/OCL

Description:

Pre-remedial action characterization study to be conducted in the ST and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two sample per ten-foot length of the trench plus two end-sidewall samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Assumptions:

Southern Trenches

Total Number of Exploratory Trenches	5	
Depth	6	ft
Number of Samples	80	
Analytes:	Ra-226, Ra-228, Sr-90, Cs-137, isotopic uranium, tritium, and C-14	

Hopland Field Station Disposal Area (HFSDA)

Total Number of Exploratory Trenches	3	
Depth	6	ft
Number of Samples	21	
Analytes:	Ra-226, Ra-228, Sr-90, Cs-137, isotopic uranium, tritium, and C-14	

Survey Exploratory Trenches

Three man crew to survey investigation trenches. Registered surveyor report. Assume surveying completed in one day after completion of investigation.

Attachment F-6a-5. Decontamination Facilities - Cost Estimates, UC Davis LEHR/OCL

Decontamination facilities for equipment and personnel during duration of remedial excavation. Include washout for decontamination of trucks leaving Site. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 36 weeks.

Equipment Decontamination Operation Length	36	weeks
(Assume construction will occur over nine months of the year)		
Average crew size	10	
Shifts	1	per day
Safety Level	Level D	

Prior to implementation of the alternatives, nine Site buildings will be demolished and hazardous waste will be disposed off-Site. Non-hazardous material will be recycled, re-used, or disposed in an on-Site CAMU. It is assumed the buildings are contaminated with asbestos, lead, and PCBs. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated. Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. Assume 1 sample per 300 ft² of building surfaces. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals.

Total Building Surface Area	43,287 ft²	
Number of samples	141	(see backup work below)
Sampling rate	75	samples/day
Crew Size	3	2 radiation technicians + 1 Health and Safety Officer

Analytical:	TCLP (RCRA) (EPA 1311)	H-292 and H-293 will also include:
	Testing, TAL metals (6010/7000s)	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total
	Pesticides/PCBs (SW 3550B/SW 8081/8082)	Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic
	Asbestos in Bulk Solids/Soils (Identification by PLM)	Testing, rad analytical vegetation/sediment/soil, gross alpha, total gas flow proportional counting

Two (2) Geriatrics Buildings (H-292 and H-293)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building Surface Area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	3,182	265	10	10
100	53	5,285	10	5	roof	5,305	442	16	6
					floor	5,285	5,285	196	6
					other building materials (assume 5% of building structure)	---	300	11	9
					Total	13,772	6,292	233	31

Five (5) Vacant Animal Housing Buildings (H-231,-232,-234,-236,-237)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	917	382	14	4
25	20	500	10	5	roof	502	42	2	1
					floor	500	500	19	1
					other building materials (assume 5% of building structure)		46	2	4
					Total	1,919	970	36	10

Storage Building at West Side of Landfill No. 3 (H-253)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	1,439	120	4	6
40	30	1,200	10	5	roof	1,205	100	4	4
					floor	1,200	1,200	44	4
					other building materials (assume 5% of building structure)		71	3	5
					Total	3,844	1,491	55	19

Co-60 Annex (H-290)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	1,039	87	3	4
30	21	630	10	5	roof	632	53	2	1
					floor	630	630	23	1
					other building materials (assume 5% of building structure)		38	1	4
					Total	2,302	808	30	10
					Grand Total (all buildings)	43,287	19,734	731	141

Demolish and dispose buildings that must be removed to implement remedial action. Assume buildings are contaminated with asbestos, lead, and PCBs. Non-hazardous demolition waste will be disposed of in the on-Site CAMUs; hazardous waste will be sent off-Site for disposal

Building

1 Demolish, dispose Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

2 Demolish, dispose Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

3

Demolish, dispose Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

4

Demolish, dispose Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

5

Demolish, dispose Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

6

Demolish, dispose Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²
Type of Building	concrete	
Number of stories	1	
Percent Hazardous Material	5%	
Height	12	ft

Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

7

Demolish, dispose Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

8

Demolish, dispose storage building near northwest corner of Landfill No. 3 (H-253). Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	1,200	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	64	CY	
Volume Hazardous	3	CY	
Safety Level	Level D		

9 Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	630	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	33	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

Note: A new building will be constructed to replace buildings H-253 and H-290. The replacement is assumed to be 1,830 square feet.

Total Volume of Non-Hazardous Building Demolition Waste to Dispose of Off-Site

0 CY

Total Volume of Hazardous Building Demolition Waste to Dispose of Off-Site

45 CY

Building Reconstruction Costs

Three warehouse buildings will be constructed. Two will be replacements for the Geriatrics buildings, H-292 and H-293, the third is to replace buildings, H-253 and H-290. Cost estimates are based on phone conversation with representative from Allied Steel (12/20/2010) and estimates from Rex Moore Electrical Contractors (12/22/2010) and J.W. McClenahan Company plumbing contractors (1/3/2011). Estimates include engineering, design, and construction. 20% contingency to be added to account for additional cost elements.

1,830 SF warehouse:

Building design and construction (with concrete foundation): $30,000	Dimensions: 35’ x 55’ x 10’	Distance to potable water main = 50 feet
Electrical: $16,031	1 restroom (toilet + sink)	Distance to sanitary sewer = 200 feet
Plumbing: $18,000	1 industrial sink	Distance to electrical distribution = 100 feet
Estimated Cost = $34.99/SF		

5,285 SF warehouse:

Building design and construction (with concrete foundation): $70,000	Dimensions: 53’ x 100’ x 10’	Distance to potable water main = 50 feet
Electrical: $27,214	1 restroom (toilet + sink)	Distance to gas = 100 feet
Plumbing: $47,250	2 industrial sinks	Distance to sanitary sewer = 300 feet
Estimated Cost = $27.34/SF	natural gas connection	

Decommission the following wells (Table 5-3):

Well	Total Boring Depth (ft bgs)	Well Diameter (inches)	Well Screen Type
DDC-1*	85.5	15	PVC
DDC-2*	80	15	PVC
DDC-3*	80	15	PVC
TP-1*	80	15	PVC
TP-2*	79	12.25	PVC
TP-3*	80.5	12.25	PVC
TP-4*	80.5	12.25	PVC
TP-5*	80	12.25	PVC
UCD1-008	56	2	PVC
UCD1-009	51.5	2	PVC
UCD1-012	65	4	PVC
UCD1-013	65	4	PVC
UCD1-050	69.5	4	Stainless Steel
UCD1-051	70	4	Stainless Steel
UCD2-014	86	4	PVC

* If nested well, value is the borehole diameter.

Attachment F-6a-9. Clearing and Grubbing - Cost Estimates, UC Davis LEHR/OCL

Clear and Grub	Clear all trees and vegetation within footprint of excavation/cap. Used current satellite photo and photographs from recent field activities to estimate amount of vegetation to clear. Assumed all removed material will be stored on-Site for re-use.	
LFU-1	Disposal	on-site, chipped
	ACRES	2.4 AC
	FLORA DENSITY	light; 5 trees per acre
LFU-2/ET/WBH	Disposal	on-site, chipped
	ACRES	3.5 AC
	FLORA DENSITY	light; 5 trees per acre
LFU-3	Disposal	on-site, chipped
	ACRES	1.0 AC
	FLORA DENSITY	light; 5 trees per acre

Attachment F-6a-10. Demolish/Backfill LFU-3 Drainage Channels - Cost Estimates, UC Davis LEHR/OCL

Description:

Demolish a portion of the LFU-3 N-S concrete-lined drainage channel along eastern boundary of LFU-3 where waste is underlying and needs to be excavated. Much of the existing channel can be left in place. The drainage area will be re-constructed in its original location post-remediation.

The E-W drainage will be backfilled and will be re-constructed post-remediation south of the LFU-3 capped area.

Major Assumptions:

Estimate the volume of concrete to be removed in demolition of Landfill Unit No. 3 N-S drainage channel:

Length (total)	270	ft
Length (portion to be demolished)	160	ft
Top Width of channel	30	ft
Bottom Width of channel	16	ft
Depth	7	ft
Thickness of concrete	0.2	ft
Length of side wall	9.9	ft
Volume of channel concrete to remove	964	ft^3
	36	CY

Estimated backfill for the current E-W channel in the footprint of the proposed cap:

Length	100	ft	
Top Width of channel	9	ft	
Bottom Width of channel	3	ft	
Depth	3	ft	
Volume to backfill:	2,700	ft^3	
	100	CY	convert to CY
	140	**CY**	**bulk factor applied**

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in LFU-1. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate Exploratory Trenches

LFU-1 TRL-35			
Volume		137	BCY
Avg. Depth		7	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-1 TRL-36			
Volume		55	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU1-T1			
Volume		38	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T2			
Volume		40	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T3			
Volume		41	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T4			
Volume		57	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	10	
LFU1-T5			
Volume		69	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	11	
LFU1-T6			
Volume		83	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	13	
LFU1-T7			
Volume		80	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	13	
Total Volume Excavated -LFU-1 PTW Trenches		838	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level D	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	838	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in LFU-2. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate Exploratory Trenches

LFU-2 TRL-12			
Volume		11	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-2 TRL-22			
Volume		48	BCY
Avg. Depth		15	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-2 TRL-20			
Volume		11	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU2-T1			
Volume		174	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	19	
LFU2-T2			
Volume		174	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	19	
LFU2-T3			
Volume		132	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	15	
LFU2-T4			
Volume		132	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	15	
Total Volume Excavated		953	CY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	953	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate proposed exploratory trenches in LFU-3. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate Exploratory Trenches

LFU3-T1			
Volume		40	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU3-T2			
Volume		44	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	8	
Total Volume Excavated		117	CY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-tota	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level D	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	117	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency	radiological work	15	%

Excavate ET North and ET South to 8 feet bgs.
Dispose of excavated PTW off-Site. Backfill ET South with non-PTW material; backfill ET North with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET North

Volume		1,171	BCY
Avg. Depth		8	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		1,639	LCY
Safety Level		Level C	

Excavate ET South

Volume		4,799	BCY
Avg. Depth		8.0	FT
Source of backfill	On-Site		
Number of confirmation samples	None, excavated area is part of capped CAMU.		
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety level C.

Load and Haul

Volume	8,358	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Excavate ET VOC "Hot Spot," east and west to depth of 20 feet bgs.

Dispose of excavated hazardous material off-Site. For ET VOC "Hot Spot," west backfill and compact with non-hazardous excavated material. For ET VOC "Hot Spot," east backfill and compact with clean fill.

Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET VOC "Hot Spot," East

Volume		713	BCY
Avg. Depth		20	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		998	LCY
Safety Level		Level C	

Excavate ET VOC "Hot Spot," West

Volume		492	BCY
Avg. Depth		20	FT
Source of backfill	On-Site		
Number of confirmation samples	None, excavated area is part of capped CAMU		
Percent to be used as backfill (on-Site)		100	%
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,686	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of ET VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-6a-16. Excavation of LFU-1 Drainage Area - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-1 Drainage Area to ten feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-1 Drainage Area

Volume	7,215	BCY
Avg. Depth	10	FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Analytical		
Testing, TAL metals (6010/7000s)	283.50	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
Testing, purgeable organics (624, 8260)	138.95	$/sample
Testing, semi-volatile organics (625, 8270)	465.84	$/sample
Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Off-Site Backfill Required	10,100	LCY
Safety Level	Level D	

Load and Haul

Volume	10,100	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Land Survey of Excavation

Survey boundaries of Landfill Unit No. 1 Drainage Area excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-6a-17. Excavation of LFU-2 VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-2 VOC "Hot Spot" to depth of 20 feet bgs. Backfill non-hazardous material in excavation.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate LFU-2 VOC "Hot Spot"

Volume		1,210	BCY
Avg. Depth		20	FT
Source of backfill	On-Site		
Number of confirmation samples	None, excavated area part of capped CAMU		
Percent to be used as backfill (On-Site)		100	%
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,693	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of LFU-2 VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-6a-18. Excavation of LFU-3 Drainage Area - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-3 Drainage Area to ten feet bgs. Backfill with clean fill.

Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-3 Drainage Area:

Volume		2,742	BCY
Avg. Depth		10	FT
Source of backfill	25 mile distance off-Site	3,839	LCY
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		3,839	LCY
Safety Level		Level D	

Load and Haul

Volume	3,839	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Land Survey of Excavation

Survey boundaries of excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency

radiological work	15	%

Attachment F-6a-19. Materials Management - Cost Estimates, UC Davis LEHR/OCL

Materials management includes activities related to the management of excavated soil and solid waste (i.e., stockpiling, sifting/sorting, waste characterization, and staging prior to final disposal).

Bulk Material Storage

Accommodate total excavated volume (TEV) across all subareas to allow for sorting, waste characterization, and staging. Stockpile excavated material in bermed, covered storage area.
Safety Level D.

TEV (from subareas excavated under this alternative)	27,916	LCY

Sifting of Excavated Material

Assume rate of sifting = 200 CY/day

Assume the use of similar equipment used under the MEC Sifting assembly. Material will be segregated into PTW, biological waste, and LTW waste streams. Safety Level C.

Soil/solid waste volume (PTW, biological waste, and LTW waste streams):	17,334	LCY
Trommel Screener	5	month
Grizzly Shaker Unit	5	month
Conveyors,	1	unit
Refuse Bottom Hopper	1	unit
5'x16' Double tray Vibrating Screening Unit	1	unit
Two full-time equipment operators, oilers (per screening operation)	1,448	hrs

Loader for Staging Area

One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled material needs to be moved. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

950, 3.0 CY, Wheel Loader (active)	500	hours
950, 3.0 CY, Wheel Loader (standby)	500	hours
Bobcat with Backhoe	5	month
All Terrain Forklift (Monthly Rental)	5	month

Waste Characterization

Assume the included materials and analyses for waste characterization prior to final disposal of excavated materials. (ET PTW and ET VOC Hotspot excavated material) 1 sample per 300 CY.

Material to be characterized:	PTW + VOC "Hot Spot" TEV	
Total Volume	3,626	LCY
Sampling rate	1	sample/300 CY (or 1 sample per container)
Number of samples	13	
Analytical suite:		
Testing, TAL metals (6010/7000s)	257.73	$/sample
TCLP (RCRA) (EPA 1311), Soil Analysis	120.30	$/sample
Testing, soil & sediment analysis, BTEX/gasoline hydrocarbons mod EPA 8020 (PID/FIFD)	107.37	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	234.37	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	278.01	$/sample
Purgeable organics (624, 8260)	126.31	$/sample
Testing, semi-volatile organics, pkd. column (8250)	416.14	$/sample
Testing, paint filter liquids test (9095)	27.90	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, ignitibility (1010)	31.64	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, corrosivity (1110, NACE)	26.04	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, reactivity (cyanide/sulfide)	72.65	$/sample
Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic	133.34	$/sample
Testing, rad analytical, additional services, characterization of any unknown rad sample (low level)	194.36	$/sample

Drum Staging

Drums for PTW laboratory waste (lab pack) disposal. Includes characterization of wastes in drums. Assume number of drums = volume of PTW in LCY divided by four. Safety Level C.

Total PTW	261	LCY
Store PTW in bulk containers	10	containers (30 CY capacity)
Number of drums	65	drums
Percentage Full	65	%
Temporary Storage Area	760	ft^2
Overpacks	85 gal. steel salvage drum	
Waste characterization	1 sample per drum, liquid waste characterization template	

Attachment F-6a-20. Excavated Materials Consolidation - Cost Estimates, UC Davis LEHR/OCL

CAMU	Volume to Consolidate [LCY]
LFU-1 CAMU	5,917
LFU-2 CAMU	5,917
LFU-3 CAMU	3,003

Attachment F-6a-21. Off-Site Transportation and Disposal - Cost Estimates, UC Davis LEHR/OCL

	LLRW (LCY)	**Mixed Waste** (LCY)	**RCRA Hazardous** (LCY)	**Non-RCRA Hazardous** (LCY)	**Non-Hazardous** (LCY)	**Building Hazardous** (LCY)	**Building Non-Hazardous** (LCY)	**Drums/Lab Pack** (number of drums)
Distance to disposal facility	594 miles	594 miles	227 miles	227 miles	93 miles	227 miles	93 miles	594 miles
Volume*	1,356	80	870	276	0	45	0	
Volume for Incineration**	0	0	0	0	0	0	0	
Final Disposal Volumes	**1,356**	**80**	**870**	**276**	**0**	**45**	**0**	**65**

* See Table E-13 (Appendix E, FS - Volume 1).
** Biological waste only.

Attachment F-6a-22. Install LFU-1 Multiple-layer Cap - Cost Estimates, UC Davis LEHR/OCL

Description:

Construct multiple-layer cap over LFU-1.

Major Assumptions:

Area:	2.0	acres
Thickness:	3.5	ft
Side slope:	3:1	(maximum)

Layers:

vegetative cover	6	inches
protection layer (clean fill/soil)	24	inches
Drainage layer (geocomposite)	-	inches
40 mil HDPE geomembrane	-	inches
Compacted Clay Layer (geocomposite clay lin	-	inches
foundation soil layer	12	inches
waste material		

Capacity of CAMU to receive waste on top of current grade and underneath cap:

8,356 CY

Volume to compact (above grade and underneath cap):

5,917 LCY

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foundation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetative cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 half-days. Licensed surveyor report.

Attachment F-6a-23. Install LFU-2/ET/WBH Multiple-layer Cap - Cost Estimates, UC Davis LEHR/OCL

Description: Construct multiple-layer cap over the LFU-2/ET/WBH.

Major Assumptions:

Area:	3.4	acres	
Thickness:	3.5	ft	
Side slope:	3:1		(maximum)
Layers:			

vegetative cover	6	inches
protection layer (clean fill/soil)	24	inches
Drainage layer (geocomposite)	-	inches
40 mil HDPE geomembrane	-	inches
Compacted Clay Layer (geocomposite clay liner)	-	inches
foundation soil layer	12	inches
waste material		

Capacity of CAMU to receive waste on top of current grade and underneath cap:
14,211 CY

Volume to compact (above grade and underneath cap):
5,917 LCY

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foundation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetative cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 half-days. Licensed surveyor report.

Attachment F-6a-24. Install LFU-3 Multiple-layer Cap - Cost Estimates, UC Davis LEHR/OCL

Description:

Construct multiple-layer cap over LFU-3.

Major Assumptions:

Area:	0.71	acres	
Thickness:	3.5	ft	
Side slope:	3:1		(maximum)
Layers:			
vegetative cover	6	inches	
protection layer (clean fill/soil)	24	inches	
Drainage layer (geocomposite)	-	inches	
40 mil HDPE geomembrane	-	inches	
Compacted Clay Layer (geocomposite clay lin	-	inches	
foundation soil layer	12	inches	
waste material			

Capacity of CAMU to receive waste on top of current grade and underneath cap:
3,003 CY

Volume to compact (above grade and underneath cap):
3,003 LCY

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foundation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetative cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 half-days. Licensed surveyor report.

Attachment F-6a-25. Install New Groundwater Wells - Cost Estimates, UC Davis LEHR/OCL

Groundwater Well Installation - Nine HSU-1 groundwater monitoring wells and one HSU-2 groundwater monitoring well would be installed. The wells will have screen/sand pack intervals of seven feet or less to minimize their potential to act as vertical conduits for downward COC migration, and will be completed just below the bottom of the depth range of seasonal water table fluctuation. In addition, it is assumed that three density-driven convection (DDC) wells and three nested piezometers would be installed as replacements for those decommissioned in the ET North.

9 HSU-1 wells, 70 ft depth, 2" diameter, PVC Schedule 80
1 HSU-2 well, 105 ft depth, 4" diameter, PVC Schedule 80
3 DDC wells, 90 ft depth, 15" diameter borehole. Each DDC well assumed to include:
- Recirculating well: 90 ft depth, 4" diameter, PVC Schedule 80
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 30 ft depth
  - Intermediate: 52 ft depth
  - Deep: 76 ft depth
- Air Injection Tubing: 90 ft depth + 35 feet to blower, 1.25" diameter, PVC Schedule 80
- Vapor Return Line: 50 feet to discharge pipe, 2" diameter, PVC Schedule 80
- Acid Drip Line: 50 feet to acid storage, 0.75" diameter, PVC Schedule 80

3 Sets of Nested Piezometers, 80 ft depth, 15" diameter borehole. Each set of piezometers assumed to include:
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 35 ft depth
  - Intermediate: 53 ft depth
  - Deep: 80 ft depth

Dispose drill cuttings as non-hazardous waste
Survey and develop completed wells

Attachment F-6a-26. Storm Drainage Controls - Cost Estimates, UC Davis LEHR/OCL

LFU-1 Storm Drainage

North-south trending vegetated swale will be constructed to east of LFU-1 cap.

Lining:	soil/vegetation	
Length	400	feet
Erosion Controls - Geotextile	326	yd^2
Erosion Controls - Rip-rap	24	CY

LFU-3 N-S Drainage Channel

North-south trending concrete-lined drainage channel will be reconstructed to match original conditions.

Length	270	ft
Top Width	30	ft
Bottom Width	16	ft
Depth	7	ft
Length of north-south drainage channel to reconstruct	160	ft

LFU-3 E-W Drainage Ditch

Re-route the east-west vegetated drainage ditch to the south of LFU-3. Install new culvert to discharge into north-south, concrete-lined drainage channel.

Lining:	soil/vegetation	
Length	260	ft
Top Width	15	ft
Depth	3	ft
Erosion Controls - Geotextile	212	yd^2
Erosion Controls - Rip-rap	16	CY

LFU-1/LFU-2/ET/WBH Collection and Conveyance System, Lift Station and Extended Detention Basin

Size Basin					
(d) Depth	4	ft	Area HDPE liner	7,850	ft^2
(l) Length	85	ft			
(w_b) Bottom Width	20	ft			
(w_t)Top Width	45	ft			
(V) Volume	11,050	ft^3			
	409	CY			
Length of piping:					
to detention basin	2500	ft			
discharge from basin	630	ft			
Number of lift stations:	2		One north of LFU-2 to pump water to detention basin, one east of detention basin to pump toward discharge at LFU-1		
Peak flow:	0.35	cfs			

LFU-3 Collection and Conveyance System, Lift Station and Extended Detention Basin

Size Basin					
(d) Depth	3	ft	Area HDPE liner	2,377	ft^2
(l) Length	40	ft			
(w_b) Bottom Width	3	ft			
(w_t)Top Width	20	ft			
(V) Volume	1,380	ft^3			
	51	CY			
Length of piping:					
to detention basin	920	ft			
discharge from basin	110	ft			
Number of lift stations:	1		On north side of LFU-3 to pump water to detention basin		
Peak flow:	0.35	cfs			

Survey :

Survey newly constructed drainage channels and detention basins. 2 half-days. Registered surveyor report.

Attachment F-6a-27. O&M: Institutional Controls - Cost Estimates, UC Davis LEHR/OCL

Perform initial survey to establish legal boundaries of Site.
Implement and maintain institutional/land use controls.
Document waste placement locations and prohibit Site development or activities incompatible with designated land use.

		# meetings	# people	# days	airfare	mileage to meeting site
Planning Documents	LUC Assurance Plan	2	2	1	0	70
	LUC Implementation Plan	2	2	1	0	70
	Construction Permitting	1	1	1	0	70
	Geographic Information Systems/Overlay Maps	1	1	1	0	70
Implementation	Deed Notification	1	unit			
	Restrictive Covenants	1	unit			
	Access Control Signs	22	unit	Assume one sign every 150 feet around perimeter of land disposal units		
	Utility Notification Service	1	unit			
	GIS/Overlay maps	1	unit			
Monitoring and Enforcement						
	Duration of monitoring/enforcement	100	years or lifetime of project			
	Reports & Certifications	1	per year			
	Site Visits/Inspections	1	per year			
Survey:	5 days, licensed surveyors' report					

Attachment F-6a-28. O&M: Groundwater and Storm Water Monitoring - Cost Estimates, UC Davis LEHR/OCL

Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the land disposal units according to Table 5-3. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, semivolatile organic compounds (1,4-dioxane by single ion monitoring) CAM 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three designated storm water sampling locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. The groundwater and storm water monitoring period will continue throughout the lifetime of the alternative until Site cleanup goals are achieved.

Includes data validation, electronic data import, data management and monitoring reports.
16 wells to be included.

Attachment F-6a-29. O&M of Storm Water Drainage Infrastructure - Cost Estimates, UC Davis LEHR/OCL

Assume annual operation and maintenance costs of $6,000/year for lifetime of drainage system.

Includes detention basins and associated infrastructure, LFU-1 drainage swale, LFU-3 drainage channels

Periodic costs incurred every ten years for repair/replacement of lift station pumps (3 lift stations).

Attachment F-6a-30. O&M of Multiple-layer Caps - Cost Estimates, UC Davis LEHR/OCL

Inspect and repair caps for lifetime of cap. Assumes some erosion and settlement, but no large scale failure.
RACER bases costs on total area of caps.

Total Capped Area: 6.04 acres

Attachment F-6a-31. Periodic Costs: Five Year Reviews - Cost Estimates, UC Davis LEHR/OCL

Review and update all documents associated with compliance, performance, land use controls. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews for period of 30 years.

Document Review	
Interviews	Current and Previous Staff Management
	Community Groups
	State Contacts
	Local Government Contacts
	Operations & Maintenance Contractors
	PRPs
	Remedial Design Consultant
Site Inspection	General Site Inspection
	Containment System Inspection
	Monitoring Systems Inspection
	Treatment Systems Inspection
	Regulatory Compliance
	Site Visit Documentation (Photos, Diagrams, etc.)
Report	

Attachment F-6a-32. Contingent Action: Install ST and HFSDA Multiple-layer Cap - Cost Estimates, UC Davis LEHR/OCL

Description:

Contingency cost: Install evapotranspiration cap at the ST and HFSDA and vegetate with native grasses to promote evapotranspiration. Add cost as contingency, assume cost equals half the cost of the LFU-3 cap (based on area).

Major Assumptions:

Area:	0.35	acres	
Thickness:	3.5	ft	
Side slope:	3:1		(maximum)
Layers:			

vegetative cover	6	inches
protection layer (clean fill/soil)	24	inches
Drainage layer (geocomposite)	-	inches
40 mil HDPE geomembrane	-	inches
Compacted Clay Layer (geocomposite clay lin	-	inches
foundation soil layer	12	inches
waste material		

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foundation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetative cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 half-days. Licensed surveyor report.

ATTACHMENT F-6b

ALTERNATIVE SW-6 ESTIMATE DOCUMENTATION REPORT

Estimate Documentation Report

System:

RACER Version: 10.3.0
Database Location: C:\Documents and Settings\gch\Application Data\AECOM\RACER 10.3\Racer.mdb

Folder:

Folder Name: Alternative SW-6

Project:

Project ID: FS_Cost
Project Name: Feasibility Study Cost Estimate
Project Category: Detailed Analysis of FS Alternatives

Location
State / Country: CALIFORNIA
City: SACRAMENTO

Location Modifier	Default	User
	1.203	1.203

Options
Database: Modified System
Cost Database Date: 2010
Report Option: Calendar

Description
Cost estimates in support of the CERCLA Feasibility Study for University of California, Davis areas of responsibility at the Laboratory for Energy-Related Health Research/Old Campus Landfill Site. Use Modified System Costs to add custom cost assemblies.

Estimate Documentation Report

Site Documentation:

Site ID: LEHR/OCL
Site Name: Alternative SW-6
Site Type: Land Disposal Units

Media/Waste Type

Primary: Soil
Secondary: N/A

Contaminant

Primary: Multi-Contaminant
Secondary: Radioactive (Low Level)

Phase Names

Pre-Study:
Study:
Design:
Removal/Interim Action:
Remedial Action:
Operations & Maintenance:
Long Term Monitoring:
Site Closeout:

Documentation

Description: Alternative SW-6. VOC "Hot Spot" Removal, Three On-Site Corrective Action Management Units with Multiple-Layer Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring.

See Section 5 of the FS for a description of this alternative.

Support Team: Weiss Staff
References: RACER 2010 System Costs Database

Estimate Documentation Report

Estimated Costs:

Phase Names	Direct Cost	Marked-up Cost
Biological Survey	$34,759	$86,304
Data Gap Investigation	$84,226	$157,394
Decontamination Facilities	$263,219	$582,436
Institutional Controls	$445,672	$1,039,283
Building D&D	$212,542	$314,966
Elderberry Mitigation	$270,000	$270,000
Clearing and Grubbing	$28,374	$52,025
Decommission GW Monitoring Wells	$440,895	$624,402
ET Excavation	$166,897	$273,170
ET VOC "Hot Spot" Excavation	$112,789	$181,700
LFU-1 Drainage Area Excavation	$376,788	$609,893
LFU-3 Drainage Area Excavation	$166,453	$269,681
Materials Management	$916,580	$1,548,268
Demolish LFU-3 N-S Drainage Channel	$3,354	$5,026
LFU-1 PTW and Exploratory Trench Excavation	$193,726	$278,207
LFU-2 VOC "Hot Spot" Excavation	$29,213	$47,289
LFU-2 PTW and Exploratory Trench Excavation	$205,478	$300,782
LFU-3 PTW and Exploratory Trench Excavation	$49,407	$71,311
Excavated Material Consolidation	$29,800	$50,438
LFU-1 Cap	$685,354	$1,113,709
LFU-2/ET/WBH Cap	$1,138,051	$1,861,724
LFU-3 Cap	$252,825	$408,092
LFU-3 Drainage Channels	$67,839	$116,775
Off-Site Transportation and Disposal	$2,019,468	$2,425,318
Install New GW Monitoring Wells	$206,121	$297,551
LFU-1 Drainage Swale	$10,442	$18,841
Storm Drainage	$427,802	$687,484
Building Reconstruction	$423,616	$423,616
Groundwater and Storm Water Monitoring	$2,799,569	$3,775,150
O&M Drainage System	$6,000	$6,000
O&M of Caps	$566,892	$1,122,241
Five-Year Reviews	$63,558	$159,250
Periodic Storm Water Lift Station Repair	$2,677	$4,012
Total Cost:	$12,700,387	$19,182,336

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Biological Survey
Description: Perform biological survey of Site prior to remedial action to assess population abundance and diversity of selected plant and animal species.

Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
RCRA Facility Investigation	Yes	100	0

Total Marked-up Cost: $86,304

Technologies:

Estimate Documentation Report

Technology Name: **RCRA Facility Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		No	n/a
Other Investigations		No	n/a
Site Distance		70	MI
Site Complexity		Low	n/a
Site Charact.			
Required Parameters			
Fieldwork Support		No	n/a
Evaluate Site Geology/Hydrogeology		No	n/a
Evaluate Site Soils/Surface Hydrology		No	n/a
Evaluate Site Meteorology		No	n/a
Evaluate Populations and Land Usage		No	n/a
Evaluate Site Ecology		Yes	n/a
Evaluate Nature and Extent of Contamination		No	n/a
Evaluate Contaminant Fate and Transport		No	n/a
Conduct Baseline Risk Assessment		No	n/a
Compose RFI Report		Yes	n/a

Comments: On-Site biological survey with particular emphasis on threatened and endangered species prior to commencement of any remedial activities.

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Data Gap Investigation
Description: Pre-remedial action characterization study to be conducted in the Southern Trenches and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two samples per ten-foot length of the trench plus two end-sidewall samples and additional QA/QC samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY	Yes	5	95
Site Inspection	Yes	100	0

Total Marked-up Cost: $157,394

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey investigation trenches. Registered surveyor report. Assume surveying completed in one day after completion of all trenches.

Estimate Documentation Report

Technology Name: **Site Inspection (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Planning		Yes	n/a
Site Investigation		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		Yes	n/a
Site Distance		70	MI
Site Complexity		Moderate	n/a
Planning			
Required Parameters			
Data Review		Yes	n/a
SI Work Plan		Yes	n/a
SI Supplemental Plans (Health and Safety,		Yes	n/a
Site Investigation			
Required Parameters			
Provide Fieldwork Support		Yes	n/a
Data Validation		Yes	n/a
Compose SI Report		Yes	n/a
Complete Revised HRS Scoring Package		Yes	n/a
Implement Community Relations		Yes	n/a
S&A			
Required Parameters			
Bioassays		No	n/a
Crew Size		2 Field Technicians	n/a
Include QA/QC Samples		Yes	n/a
Groundwater		No	n/a
Surface Water		No	n/a
Sampling - Water: Primary Analytical Template		None	n/a
Sampling - Water: Secondary Analytical Template		None	n/a
Surface Soil		No	n/a
Subsurface Soil		Yes	n/a
Sediment		No	n/a
Sampling - Soil/Sediment: Primary Analytical Template		System Soil - Low Level Radioactive	n/a

Estimate Documentation Report

Technology Name: **Site Inspection (# 1)**

Description	*Default*	*Value*	*UOM*
S&A			
Required Parameters			
Sampling - Soil/Sediment: Secondary Analytical Template		None	n/a
Air		No	n/a
Soil Gas		No	n/a
Sampling - Air/Soil Gas: Primary Analytical Template		None	n/a
Sampling - Air/Soil Gas: Secondary Analytical Template		None	n/a
Media			
Required Parameters			
Subsurface Soil: Avg. Sample Depth		12	FT
Subsurface Soil: # Sampling Locations		8	EA
Subsurface Soil: # Samples per Location		13	EA
Subsurface Soil: # Rounds		1	EA
Methodology			
Required Parameters			
Methodology: Subsurface Soil	Power Auger	Air Rotary Rig	n/a
Methodology: Turnaround Time		Standard (21 Days)	n/a
Methodology: Quality Control		Level 4	n/a

Comments: Pre-remedial action characterization study to be conducted in the Southern Trenches and the HFSDA. Assume 5 exploratory trenches in the ST. Assume 3 exploratory trenches in the HFSDA. Soil samples will be collected from the exploratory trenches; assume two sample per ten-foot length of the trench plus two end-sidewall samples. Exploratory trenches will be sited in areas suspected to have waste and previously not investigated. Analyze samples for radium-226 and 228, Sr-90, C-14, Cs-137, H-3, and isotopic uranium. Any PTW encountered will be sent for off-Site disposal. The results of the study will indicate whether further remedial action is needed in these areas.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decontamination Facilities
Description: Provide decontamination facilities for equipment and personnel throughout duration of the remedial action.

Approach: Ex Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Decontamination Facilities	Yes	100	0

Total Marked-up Cost: $582,436

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		554,701	$
Percentage	19	5	%
Dollar Amount		27,735	$

Comments:

Estimate Documentation Report

Technology Name: **Decontamination Facilities (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
New Decontamination Facility Pad Construction		No	n/a
Equipment Rating		n/a	n/a
Equipment Decontamination Operations		Yes	n/a
Equipment Decontamination Operations: Duration		36	weeks
Personnel Decontamination Trailers		Yes	n/a
Personnel Decontamination Trailers: Average Crew Size		10	per shift
Personnel Decontamination Trailers: Duration		36	weeks
Safety Level		D	n/a
Work Shifts			
Secondary Parameters			
Equipment Decontamination	One Shift per Day		n/a
Personnel Decontamination	One Shift per Day		n/a

Comments: Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 36 weeks.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Institutional Controls
Description: Implement and maintain Institutional/Land Use Controls to prohibit Site development or activities incompatible with designated land use.

Approach: In Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
INITIAL LAND SURVEY	Yes	5	95
ADMINISTRATIVE LAND USE CONTROLS	Yes	100	0

Total Marked-up Cost: $1,039,283

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **INITIAL LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		INITIAL LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew to establish legal boundaries defining the Site's boundaries. Licensed surveyor report. 3 man survey crew - 5 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Rename Model		ADMINISTRATIVE LAND USE CONTROLS	n/a
Planning Documents		Yes	n/a
Planning Documents: Start Date		2010	n/a
Implementation		Yes	n/a
Implementation: Start Date		2010	n/a
Monitoring & Enforcement		Yes	n/a
Monitoring & Enforcement: Start Date		2010	n/a
Modification/Termination		No	n/a
Type of Site		Former Government Site	n/a
Planning Documents			
Required Parameters			
LUC Assurance Plan (LUCAP)		Yes	n/a
LUC Assurance Plan (LUCAP): Plan Complexity		Medium	n/a
LUC Implementation Plan (LUCIP)		Yes	n/a
LUC Implementation Plan (LUCIP): Number		1	EA
LUC Implementation Plan (LUCIP): Plan Complexity		Medium	n/a
Long-term Stewardship (LTS) Plan		No	n/a
Memorandum of Agreements (MOA)		No	n/a
Installation (or City) Master Plan		No	n/a
Construction Permitting		Yes	n/a
Construction Permitting: Number		1	EA
Construction Permitting: Plan Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Plan Complexity		Low	n/a
Planning Meetings			
Required Parameters			
LUCAP: Number of Meetings		2	EA
LUCAP: Number of People		2	EA

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Planning Meetings			
Required Parameters			
LUCAP: Number of Days		1	EA
LUCAP: Airfare Cost		0	$
LUCAP: Mileage to Meeting Site		70	MI
LUCIP: Number of Meetings		2	EA
LUCIP: Number of People		2	EA
LUCIP: Number of Days		1	EA
LUCIP: Airfare Cost		0	$
LUCIP: Mileage to Meeting Site		70	MI
Construction Permitting: Number of Meetings		1	EA
Construction Permitting: Number of People		1	EA
Construction Permitting: Number of Days		1	EA
Construction Permitting: Airfare Cost		0	$
Construction Permitting: Mileage to Meeting Site		70	MI
GIS/Overlay Maps: Number of Meetings		1	EA
GIS/Overlay Maps: Number of People		1	EA
GIS/Overlay Maps: Number of Days		1	EA
GIS/Overlay Maps: Airfare Cost		0	$
GIS/Overlay Maps: Mileage to Meeting Site		70	MI
Implementation			
Required Parameters			
Modify Installation (or City) Master Plan		No	n/a
Deed Notification		Yes	n/a
Deed Notification: Number		1	EA
Deed Notification: Task Complexity		Low	n/a
Negotiating Easements		No	n/a
Restrictive Covenants		Yes	n/a
Restrictive Covenants: Number		1	EA
Restrictive Covenants: Task Complexity		Low	n/a
Equitable Servitudes		No	n/a
Access Control Signs		Yes	n/a

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Implementation			
Required Parameters			
Access Control Signs: Number		22	EA
Access Control Signs: Task Complexity		Low	n/a
Utility Notification Service		Yes	n/a
Access Control Signs: Number		1	EA
Access Control Signs: Task Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Task Complexity		Low	n/a
Develop Finding of Suitability to Transfer (FOST)		No	n/a
Monitoring & Enforcement			
Required Parameters			
Duration of Monitoring/Enforcement		31	Years
Notice Letters		No	n/a
Guard Service/Security		No	n/a
Reports & Certifications		Yes	n/a
Reports & Certifications: Frequency		Annually	n/a
Site Visits/Inspections		Yes	n/a
Site Visits/Inspections: Number		1	EA
Site Visits/Inspections: Safety Level		D	n/a
Site Visits/Inspections: Duration		1	Days
Site Visits/Inspections: Number of People		2	EA
Site Visits/Inspections: Frequency		Annually	n/a
Site Visits/Inspections: Airfare		0	$ Per Ticket
Site Visits/Inspections: Mileage		70	MI

Comments: Implement and maintain land use controls to prohibit Site development or activities incompatible with designated land use.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building D&D
Description: Prior to implementation of the alternative, nine Site buildings will be demolished and associated hazardous demolition material will be disposed off-Site. It is assumed that five percent of the demolition waste is contaminated with asbestos, lead, and PCBs. Non-hazardous building material will be recycled or disposed of in an on-Site CAMU. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated.
Apply 15% contingency for worker safety and additional waste volume.

Approach: Ex Situ
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Professional Labor Management	Yes	100	0
D&D, Sampling and Analysis	Yes	100	0

Total Marked-up Cost: $314,966

Technologies:

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		630	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		33.25	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		1.75	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		1,200	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		63.65	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		3.35	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose storage building (H-253) near northwest corner of Landfill No. 3. Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		191,492	$
Percentage	19.8	19.8	%
Dollar Amount		37,915	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Mobilizations		1	EA
Mobilization Distance		70	MI (One-way)
Soil/Sediment: # of Samples		0	EA
Soil/Sediment: Survey Area		0	SF
Water/Liquid: # of Samples		0	EA
Water/Liquid: Survey Area		0	SF
Building Surfaces: # of Samples		141	EA
Building Surfaces: Survey Area		43,287	SF
Sampling Rate		75	Per Day
Sampling Crew Size		2 Radiation Technicians, 1 Health and Safety Officer	n/a
Safety Level		D	n/a
Laboratory Analyses			
Required Parameters			
Soil: Alpha		No	n/a
Soil: Beta		No	n/a
Soil: Gamma		No	n/a
Soil: VOC"s		No	n/a
Soil: SVOC"s		No	n/a
Soil: Fuels		No	n/a
Soil: Pesticides		No	n/a
Soil: PCB"s		No	n/a
Soil: Metals		No	n/a
Soil: Acids/Caustics		No	n/a
Soil: Ordnance Residual		No	n/a
Water: Alpha		No	n/a
Water: Beta		No	n/a
Water: Gamma		No	n/a
Water: VOC"s		No	n/a
Water: SVOC"s		No	n/a

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Laboratory Analyses			
Required Parameters			
Water: Fuels		No	n/a
Water: Pesticides		No	n/a
Water: PCB"s		No	n/a
Water: Metals		No	n/a
Water: Acids/Caustics		No	n/a
Water: Ordnance Residual		No	n/a
Building: Alpha		No	n/a
Building: Beta		No	n/a
Building: Gamma		No	n/a
Building: VOC"s		No	n/a
Building: SVOC"s		No	n/a
Building: Fuels		No	n/a
Building: Pesticides		No	n/a
Building: PCB"s		Yes	n/a
Building: Metals		Yes	n/a
Building: Acids/Caustics		No	n/a
Building: Ordnance Residual		No	n/a
QA Blanks: Soil/Sediment		0	%
QA Blanks: Water/Liquid		0	%
QA Blanks: Building		15	%
Hand Scanning		1	Days
Adjustments/Productivity			
Secondary Parameters			
Turnaround Time		Standard (21 Days)	n/a
Quality Control		Level 1	n/a
Height Adjustment	15	15	%
Protective Clothing	23	23	%
RADCON	15	15	%
Respiratory Protection	38	38	%
Breaks	10	10	%

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Adjustments/Productivity			
Secondary Parameters			
Productivity Loss Multiplier	2.32	n/a	n/a

Comments: Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. One sample per ~300 ft2. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals. At two Geriartics Buildings H-292 and H-293, include radiological analyses.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Elderberry Mitigation
Description: Identify elderberry shrub clusters within work boundaries and relocate them within UC boundaries.

Approach: None
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ELDERBERRY SHRUB CLUSTER RELOCATION	No	0	0

Total Marked-up Cost: $270,000

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **ELDERBERRY SHRUB CLUSTER RELOCATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ELDERBERRY SHRUB CLUSTER RELOCATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.02	n/a
Safety Level		D	n/a

Comments: Cost for Elderberry mitigation based on previous transplanting operations at UC Davis.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decommission GW Monitoring Wells
Description: Decommission groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Residual Waste Management	Yes	80	20
Well Abandonment	Yes	20	80

Total Marked-up Cost: $624,402

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		594,669	$
Percentage	19	5	%
Dollar Amount		29,733	$

Comments:

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		41	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Estimate Documentation Report

Technology Name: **Well Abandonment (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Abandon Wells			
Required Parameters			
Technology/Group Name		DDC Wells	n/a
Number of Wells		3	EA
Well Depth		85	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		TP-1 through TP-5	n/a
Number of Wells		5	EA
Well Depth		81	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-1 Wells	n/a
Number of Wells		6	EA
Well Depth		64	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-2 Well	n/a
Number of Wells		1	EA
Well Depth		86	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a

Comments: Decommission wells according to Table 5-3.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Area Excavation
Description: Excavate LFU-1 Drainage Area. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean fill. Revegetate surface. Load and haul soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $609,893

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		491,228	$
Percentage	19.2	19.2	%
Dollar Amount		94,316	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		7,215	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	14	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	41	41	EA
Number of Composites Submitted to Lab	11	11	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 1 Drainage Area.
Collect default number of confirmation samples.
Backfill and compact with clean fill. Revegetate surface, a drainage swale will be constructed in this area after excavation..

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		3,839	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavated material to stockpiling areas. Assume stockpile area is immediately adjacent to LFU-3 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Drainage Area Excavation
Description: Excavate LFU-3 Drainage Area. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean import soil. Revegetate surface. Load and haul Landfill Unit 3 soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $269,681

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		204,956	$
Percentage	19.7	19.7	%
Dollar Amount		40,376	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		2,742	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	20	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	18	18	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 3 waste cells.
Collect default number of confirmation samples.
Backfill and compact with clean import soil. Revegetate surface.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		3,839	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavated material to stockpiling areas. Assume stockpile area is immediately adjacent to LFU-3 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Clearing and Grubbing
Description: Clear and grub areas to be excavated and/or capped.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80

Total Marked-up Cost: $52,025

Technologies:

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		2.42	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		424.830993652344	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 1 footprint.
Current satellite photo and photographs from recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume grubbed material will be kept on-site for re-use.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		3.48	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		610.914001464844	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 2/Eastern Trenches/Waste Burial Holes footprint.
Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range. Assume chipping and stockpiling is done on-site.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		1.01	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		177.30549621582	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear trees and vegetation at Landfill Unit 3. Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range. Assume grubbed material is stored and re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Materials Management
Description: Excavated material will be handled in accordance with a Materials Management Plan. Materials Management includes the cost of storage/stockpiling, sorting of waste streams, waste characterization, and staging for final disposal. Disposal is handled in a separate cost element. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Drum Staging	Yes	20	80
LOADER FOR STAGING AREA	Yes	0	100
WASTE CHARACTERIZATION SAMPLING	Yes	100	0
Professional Labor Management	Yes	80	20
Bulk Material Storage	Yes	20	80
Bulk Material Storage	Yes	20	80
SIFTING OF EXCAVATED MATERIAL	Yes	20	80

Total Marked-up Cost: $1,548,268

Technologies:

Estimate Documentation Report

Technology Name: **Drum Staging (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Waste		Solid	n/a
Solid: To be Staged		65	EA
Solid: Leaking/Damaged Requiring Overpacks		0	EA
Solid: To be Sampled		65	EA
Solid: Second Sample per Drum		No	n/a
Temporary Staging Area		760	SF
Drums to be Consolidated (Drums to Bulk)		65	EA
Drum Average Percentage Full		65	%
Safety Level		C	n/a
Handling			
Secondary Parameters			
Overpacks		85 Gal. Steel Salvage Drum	n/a
First Sample Analysis: Liquid		Waste Characterization, Liquid	n/a
First Sample Analysis: Solid / Sludge		Waste Characterization, Solids	n/a
Second Sample Analysis: Liquid		None	n/a
Second Sample Analysis: Solid / Sludge		None	n/a
Storage			
Secondary Parameters			
Liner/Temporary Staging Area	60 Mil Polymeric Liner, HDPE	60 Mil Polymeric Liner, HDPE	n/a
Drum Storage Systems: Quantity	0	0	EA
Drum Storage Systems: Type	Poly Spill Pallet, 4 Drum Cap	Poly Spill Pallet, 4 Drum Cap	n/a
Containment Berms: Quantity	0	0	EA
Containment Berms: Type	10" x 10" x 17", 750 Gallon	10" x 10" x 17", 750 Gallon	n/a

Comments: Drums for principal threat wastes/lab packs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LOADER FOR STAGING AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LOADER FOR STAGING AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled dirt needs to be moved around. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

Technology Name: **User Defined Estimate (# 2)**
User Name: **WASTE CHARACTERIZATION SAMPLING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WASTE CHARACTERIZATION SAMPLING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.06	n/a
Safety Level		D	n/a

Comments: Assume the included materials and analyses for waste characterization prior to final disposal of PTW and VOC "Hot Spot" TEV.
Assume 1 sample per 300 CY for costing purposes only. Actual sampling rate will be considered during remedial design.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		519,127	$
Percentage	19.1	19.1	%
Dollar Amount		99,153	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Bulk Material Storage (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Roll-Off/Bulk Containers/Tanks	n/a
Quantity of Material		261	CY
Safety Level		C	n/a
Secondary			
Secondary Parameters			
Size	30 CY Open Top Roll-Off Container	30 CY Open Top Roll-Off Container	n/a
Quantity	10	10	n/a

Comments: Bulk containers for PTW.

Estimate Documentation Report

Technology Name: **Bulk Material Storage (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Soil Bermed Storage Area	n/a
Quantity of Material		27,916	CY
Safety Level		D	n/a
Secondary			
Secondary Parameters			
Storage Area Quantity	1	1	EA
Storage Area Length	239	239	FT
Storage Area Width	239	239	FT
Berm Height	2	2	FT
Berm Top Width	2	2	FT
Slope: Feet Run / 1 Foot Rise	3	3	FT
Polymeric Liner Material	40 Mil Polymeric Liner, PVC	40 Mil Polymeric Liner, PVC	n\a
Polymeric Liner Quantity	1	1	EA
Soil Liner Material	None	None	n/a
Soil Liner Thickness	0	0	IN
Liner Protection Layer Material	Gravel	Gravel	n/a
Liner Protection Layer Thickness	12	12	IN

Comments: Stockpile TEV.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **SIFTING OF EXCAVATED MATERIAL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		SIFTING OF EXCAVATED MATERIAL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.90	n/a
Safety Level		C	n/a

Comments: Sorting of excavated material to segregate principal threat wastes. Assume the use of similar equipment used under the MEC Sifting assembly. Assume rate of sorting is approximately 200 CY/day.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET VOC "Hot Spot" Excavation
Description: Excavate ET VOC "Hot Spot." Apply 15% contingency for radiological work and backfill requirements.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Excavation	Yes	5	95

Total Marked-up Cost: $181,700

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,686	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		140,413	$
Percentage	19.9	19.9	%
Dollar Amount		27,942	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		713	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	58	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	6	6	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate the ET VOC "Hot Spot," East to a depth of 20 feet bgs. Backfill with clean fill.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		492	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	63	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate ET VOC "Hot Spot," West.

Excavation to be backfilled and compacted with Site consolidated soil/solid waste.
Level C PPE assumed because of potential VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET Excavation
Description: Excavate waste cell contents in ET North and ET South, including contact soil and surrounding contaminated soil to depth of waste plus 2 feet overexcavation (use avg. trench depth + 2 feet for costing purposes). Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Load and haul ET excavated material to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work and backfill requirements.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Excavation	Yes	5	95

Total Marked-up Cost: $273,170

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 4 x 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		8,358	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET excavated material to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		190,865	$
Percentage	19.8	19.8	%
Dollar Amount		37,791	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,171	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	10	10	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate ET North. Average waste cell depth = 8 ft bgs.

Collect confirmation samples.

Backfill and compact with clean fill.

Level C safety assumed due to VOC impacted soil.

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		4,799	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	12	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate ET South.

Excavation to be backfilled and compacted with Site consolidated excavated material.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added excavation volume, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $278,207

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		83	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	51	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	13	EA
Number of Composites Submitted to Lab	5	13	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T6 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		80	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	51	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	13	EA
Number of Composites Submitted to Lab	5	13	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T7 PTW excavation

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		210,234	$
Percentage	19.7	19.7	%
Dollar Amount		41,416	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		838	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		137	CY
Depth		7	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	40	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-35 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		55	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	45	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-36 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		38	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T1 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		40	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T2 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		41	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T3 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		57	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	56	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	10	EA
Number of Composites Submitted to Lab	5	10	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T4 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		69	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	53	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	11	EA
Number of Composites Submitted to Lab	5	11	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T5 PTW excavation

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		2.4	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added volume of excavation, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $300,782

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		132	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	15	EA
Number of Composites Submitted to Lab	5	15	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T3 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		132	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	15	EA
Number of Composites Submitted to Lab	5	15	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T4 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		228,564	$
Percentage	19.7	19.7	%
Dollar Amount		45,027	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		953	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		11	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	74	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-2 TRL-12 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		48	CY
Depth		15	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	78	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-22 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		11	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	65	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-2 TRL-20 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		174	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	54	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	19	EA
Number of Composites Submitted to Lab	5	19	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T1 excavation. Collect soil/solid waste samples.

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		174	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	54	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	19	EA
Number of Composites Submitted to Lab	5	19	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T2 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		2.2	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 PTW and Exploratory Trench Excavation
Description: Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added volume of excavation, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $71,311

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		40	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU3-T1 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		44	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	59	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	8	EA
Number of Composites Submitted to Lab	5	8	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU3-T2 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		46,193	$
Percentage	20.1	20.1	%
Dollar Amount		9,285	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		117	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		1	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 VOC "Hot Spot" Excavation
Description: Excavate LFU-2 VOC "Hot Spot." Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $47,289

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,210	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	52	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate the LFU-2 VOC "Hot Spot" to a depth of 20 feet bgs.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,693	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul LFU-2 VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		28,263	$
Percentage	20.1	20.1	%
Dollar Amount		5,681	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Demolish LFU-3 N-S Drainage Channel
Description: The concrete lined drainage channel which partially overlays LFU-3 will be removed.
New N-S drainage channels will be re-constructed post-remediation.
This cost estimate assumes that a termporary drainage channel will not have to be created since the remedial action will take place in the dry season.

Approach: Ex Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
DEMOLISH LFU3 N-S DRAINAGE CHANNEL	Yes	100	0

Total Marked-up Cost: $5,026

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **DEMOLISH LFU3 N-S DRAINAGE CHANNEL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DEMOLISH LFU3 N-S DRAINAGE CHANNEL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.01	n/a
Safety Level		D	n/a

Comments: Demolish gunnite lined north-south drainage channel overlaying Landfill Unit 3 in area where waste cells lie adjacent to channel. Assume thickness of gunnite lining = 2inches, length of channel is 270 feet, top width of channel is 30 feet, base width of channel is 16 feet, depth of channel is 7 feet. Assume 160 feet of the channel will need to be demolished. The channel will be demolished to remove underlying waste. The channel will be restored in its original location. Demolished concrete will be re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Excavated Material Consolidation
Description: Consolidate non-PTW excavated material from excavations in on-Site CAMUs. 10% contingency applied for consolidation of additional volume.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
CONSOLIDATE WASTE IN LFU-1 CAMU	Yes	5	95
CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU	Yes	5	95
CONSOLIDATE WASTE IN LFU-3 CAMU	Yes	5	95

Total Marked-up Cost: $50,438

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **CONSOLIDATE WASTE IN LFU-1 CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LFU-1 CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in LFU-1 CAMU.

Technology Name: **User Defined Estimate (# 2)**
User Name: **CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in LFU-2/ET/WBH CAMU.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **CONSOLIDATE WASTE IN LFU-3 CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LFU-3 CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in LFU-3 CAMU.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Cap
Description: Install multiple-layer cap over LFU-1. Dispose non-hazardous waste generated by construction activities. Grade cap and surrounding area to promote drainage into storm drainage system. Survey boundaries of completed cap. 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Off-site Transportation and Waste Disposal	Yes	5	95
Capping	Yes	20	80
LAND SURVEY OF CAP	Yes	5	95
GRADE AROUND CAP TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $1,113,709

Technologies:

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		5	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-1 cap construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		RCRA C (Hazardous Waste) Cap	n/a
Acres		2	AC
Length		417	FT
Width		209	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	52	52	FT
Horizontal Projection of Top Slope	52	52	FT
RCRA C			
Secondary Parameters			
Surface Layer Type	Vegetated Layer	Vegetated Layer	n/a
Surface Layer Thickness	6	6	IN
Surface Layer Borrow Source	Off-site	Off-site	n/a
Protection Layer Thickness	24	24	IN
Protection Layer Borrow Source	Off-site	Off-site	n/a
Drainage Layer Type	Geocomposite	Geocomposite	n/a
Composite Barrier: Geomembrane Type	40 Mil HDPE	40 Mil HDPE	n/a
Composite Barrier: Compacted Clay Layer Type	Geosynthetic Clay Liner	Geosynthetic Clay Liner	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a
Gas Vent System		No	n/a

Comments: Install multiple-layer cap over Landfill Unit 1.
Total area of Landfill Unit 1 to be capped is assumed to cover 1.72 acres.
Additional cap area assumed based on cap extending 10.5 feet beyond Landfill Unit 1 perimeter due to 3.5 foot thick cap and 3:1 maximum slope.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF CAP**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF CAP	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foudation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetatitve cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 x 1/2 day. Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **GRADE AROUND CAP TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND CAP TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around cap to promote drainage.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		932,213	$
Percentage	18.3	18.3	%
Dollar Amount		170,595	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2/ET/WBH Cap
Description: Install multiple-layer cap over the footprint of LFU-2, ETs and WBHs. Assumes 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF CAP	Yes	5	95
Off-site Transportation and Waste Disposal	Yes	5	95
GRADE AROUND CAP TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Capping	Yes	20	80

Total Marked-up Cost: $1,861,724

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF CAP**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF CAP	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foudation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetatitve cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 x 1/2 day. Licensed surveyor report.

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		5	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-2/ET/WBH cap construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **GRADE AROUND CAP TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND CAP TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around cap to promote drainage.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		1,581,901	$
Percentage	17	17	%
Dollar Amount		268,923	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		RCRA C (Hazardous Waste) Cap	n/a
Acres		3.4	AC
Length		544	FT
Width		272	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	68	68	FT
Horizontal Projection of Top Slope	68	68	FT
RCRA C			
Secondary Parameters			
Surface Layer Type	Vegetated Layer	Vegetated Layer	n/a
Surface Layer Thickness	6	6	IN
Surface Layer Borrow Source	Off-site	Off-site	n/a
Protection Layer Thickness	24	24	IN
Protection Layer Borrow Source	Off-site	Off-site	n/a
Drainage Layer Type	Geocomposite	Geocomposite	n/a
Composite Barrier: Geomembrane Type	40 Mil HDPE	40 Mil HDPE	n/a
Composite Barrier: Compacted Clay Layer Type	Geosynthetic Clay Liner	Geosynthetic Clay Liner	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a
Gas Vent System		No	n/a

Comments: Install multiple-layer cap over the combined footprint of Landfill Unit 2, Eastern Trenches and Waste Burial Holes. Excludes north end of Eastern Trenches.
Additional cap area assumed based on cap extending 10.5 feet beyond waste perimeter due to 3.5 foot thick cap and 3:1 maximum slope.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Cap
Description: Install multiple-layer cap over LFU-3. Dispose non-hazardous waste generaged by construction activities. Grade cap and surrounding area to promote drainage into storm drainage system. Survey boundaries of completed cap.

Approach: In Situ
Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
GRADE AROUND CAP TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Off-site Transportation and Waste Disposal	Yes	5	95
Capping	Yes	20	80
LAND SURVEY OF CAP	Yes	5	95

Total Marked-up Cost: $408,092

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **GRADE AROUND CAP TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND CAP TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around cap to promote drainage.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		336,858	$
Percentage	19.5	19.5	%
Dollar Amount		65,687	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		10	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-3 cap construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		RCRA C (Hazardous Waste) Cap	n/a
Acres		0.71	AC
Length		249	FT
Width		124	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	31	31	FT
Horizontal Projection of Top Slope	31	31	FT
RCRA C			
Secondary Parameters			
Surface Layer Type	Vegetated Layer	Vegetated Layer	n/a
Surface Layer Thickness	6	6	IN
Surface Layer Borrow Source	Off-site	Off-site	n/a
Protection Layer Thickness	24	24	IN
Protection Layer Borrow Source	Off-site	Off-site	n/a
Drainage Layer Type	Geocomposite	Geocomposite	n/a
Composite Barrier: Geomembrane Type	40 Mil HDPE	40 Mil HDPE	n/a
Composite Barrier: Compacted Clay Layer Type	Geosynthetic Clay Liner	Geosynthetic Clay Liner	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a
Gas Vent System		No	n/a

Comments: Install multilayer cap over Landfill Unit 3.
Total area of Landfill Unit 3 to be capped is assumed to cover 0.71 acres.
Additional cap area assumed based on cap extending 10.5 feet beyond Landfill Unit 3 perimeter due to 3.5 foot thick cap and 3:1 maximum slope.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF CAP**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF CAP	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foudation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetatitve cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 x 1/2 day. Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Drainage Channels
Description: The concrete lined drainage channel which partially overlays LFU-3, will be reconstructed post-remediation.
The E-W LFU-3 drainage channel will also be reconstructed south of its original location.

Approach: Ex Situ
Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
E-W DITCH CONSTRUCTION	Yes	20	80
N-S DRAINAGE CHANNEL CONSTRUCTION	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $116,775

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **E-W DITCH CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		E-W DITCH CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Construction of new east-west drainage ditch at LFU-3, south of its original location. Assume 260 feet needed. This drainage ditch currently drains the Raptor Center and vicinity. It will discharge into the larger N-S concrete lined drainage ditch.

Technology Name: **User Defined Estimate (# 2)**
User Name: **N-S DRAINAGE CHANNEL CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		N-S DRAINAGE CHANNEL CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Reconstruction of north-south, drainage ditch. Assume 160 feet need to be restored with concrete lining.

Technology Name: **User Defined Estimate (# 3)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage channels. 2 x 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Off-Site Transportation and Disposal
Description: Transport and dispose of RCRA hazardous, mixed waste, Non-RCRA hazardous, LLRW, and non-hazardous waste material generated by Site remedial excavations. Hazardous wastes will be transported to Class I hazardous waste facility; solid LLRW and mixed waste to LLRW accepting facility; and non-hazardous materials at Class II non-hazardous landfill. Assume drummed PTW will be sent to the LLRW accepting facility, and biological waste will be incinerated.

Approach: Ex Situ
Start Date: September, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0

Total Marked-up Cost: $2,425,318

Technologies:

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Non-leaking Drums	n/a
Quantity of Non-Leaking Drums		65	Drums
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dipose of drums containing PTW requiring stabilization. Assume default acceptance and treatment fee. Assume 594 mile transport distance.

Technology Name: **Off-site Transportation and Waste Disposal (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Low-Level Radioactive Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		1,356	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose LLRW. Assume $1,080/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Mixed Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		80	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose mixed waste. Assume $2,814/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		869	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose RCRA hazardous waste. Assume $170/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		276	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose non-RCRA hazardous waste. Assume $85/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Install New GW Monitoring Wells
Description: Install, develop, and survey new groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
WELL DEVELOPMENT	Yes	40	60
Groundwater Monitoring Well	Yes	40	60
Residual Waste Management	Yes	80	20
LAND SURVEY	Yes	5	95
DDC WELL AND PIEZOMETER INSTALLATION	Yes	100	0

Total Marked-up Cost: $297,551

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		121,933	$
Percentage	19.9	5	%
Dollar Amount		6,097	$

Comments:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **WELL DEVELOPMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WELL DEVELOPMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.01	n/a
Safety Level		D	n/a

Comments: Rent equipment for well develoment for 1 week. One equipment operator and one supervising engineer/geologist.

Estimate Documentation Report

Technology Name: **Groundwater Monitoring Well (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Aquifers		Two	n/a
Include Guard Posts		No	n/a
Depth to Groundwater to Aquifer One		50	FT
Number of Wells to Aquifer One		9	EA
Depth to Groundwater to Aquifer Two		50	FT
Number of Wells to Aquifer Two		1	EA
Safety Level		D	n/a
Aquifer One			
Required Parameters			
Aquifer One: Average Well Depth		70	LF
Aquifer One: Formation Type		Unconsolidated	n/a
Aquifer One: Drilling Method		Hollow Stem	n/a
Aquifer One: Well Diameter		2 Inch	n/a
Aquifer One: Well Construction Material		PVC Schedule 80	n/a
Aquifer One: Split Spoon Sample Collection		Yes	n/a
Aquifer One: Average Number of Soil Samples per Well		0	EA
Aquifer One: Soil Analytical Template		None	n/a
Aquifer One: Safety Level		D	n/a
Aquifer Two			
Required Parameters			
Aquifer Two: Average Well Depth		105	LF
Aquifer Two: Formation Type		Unconsolidated	n/a
Aquifer Two: Drilling Method		Hollow Stem	n/a
Aquifer Two: Well Diameter		4 Inch	n/a
Aquifer Two: Well Construction Material		PVC Schedule 80	n/a
Aquifer Two: Split Spoon Sample Collection		Yes	n/a
Aquifer Two: Average Number of Soil Samples per Well		0	EA
Aquifer Two: Soil Analytical Template		None	n/a
Aquifer Two: Safety Level		D	n/a

Comments: Install new wells according to Table 5-3.

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		10	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey newly installed groundwater monitoring wells. Registered surveyor report. 0.5 day

Technology Name: **User Defined Estimate (# 4)**
User Name: **DDC WELL AND PIEZOMETER INSTALLATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DDC WELL AND PIEZOMETER INSTALLATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.90	n/a
Safety Level		D	n/a

Comments: Installation cost of 3 density-driven convection wells and 3 sets of nested piezometers (each nest containing 3 piezometers) as replacements for those decommissioned in the ET North.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Storm Drainage
Description: Install storm drainage controls for the lined and capped CAMU. Drainage piping will be added to the perimeter of the CAMU which will discharge runoff into a detention basin. The detention basin will discharge to either the LFU-1 discharge point or the LFU-3 north-south concrete lined drainage channel depending on the basin's location.

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY	Yes	5	95
STORM WATER DETENTION BASIN	Yes	20	80
Excavation	Yes	5	95
STORM WATER DETENTION BASIN	Yes	20	80
Excavation	Yes	5	95

Total Marked-up Cost: $687,484

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage control system. 1/2 day. Registered surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **STORM WATER DETENTION BASIN**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		STORM WATER DETENTION BASIN	n/a
WBS Type		HTRW	n/a
Selected WBS		331.09.07	n/a
Safety Level		D	n/a

Comments: Install detention basin to receive runoff from the LFU-1 and LFU-2/ET/WBH capped CAMUs.

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,346	CY
Depth		9	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	24	70	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate detention basin serving LFU-1 and LFU-2/ET/WBH CAMUs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **STORM WATER DETENTION BASIN**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		STORM WATER DETENTION BASIN	n/a
WBS Type		HTRW	n/a
Selected WBS		331.09.07	n/a
Safety Level		D	n/a

Comments: Install detention basin to receive runoff from the LFU-3 capped CAMU.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		319	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	35	84	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate detention basin at LFU-3.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Swale
Description: Install a north-south trending unlined storm drainage channel in LFU-1 drainage area (assume 380 ft).

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LFU-1 DRAINAGE SWALE	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $18,841

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LFU-1 DRAINAGE SWALE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LFU-1 DRAINAGE SWALE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: North-south trending unlined storm drainage channel will be constructed in LFU-1 drainage area (assume 380 ft).

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage improvements. 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building Reconstruction
Description: Replace buildings H-253, H-290, H-292, and H-293 with three new buildings during site restoration. The two Geriatrics buildings will be reconstructed. The LFU-3 storage building and Cobalt-60 Annex will replaced with one building equal in area to the two combined. The X buildings will not be replaced.

Approach: Ex Situ
Start Date: November, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0

Total Marked-up Cost: $423,616

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-292 (Geriatrics Building No. 1)

Technology Name: **User Defined Estimate (# 2)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-293 (Geriatrics Building No. 2)

Technology Name: **User Defined Estimate (# 3)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace buildings H-253 and H-290 with one builing equivalen in square footage.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 4)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Add 20% contingency to cost of building reconstruction.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Groundwater and Storm Water Monitoring
Description: Groundwater monitoring and storm water monitoring for lifetime of alternative until cleanup objectives are met. Sample collection, analysis, data validation, data import and monitoring reports.

Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
MONITORING	Yes	100	0

Total Marked-up Cost: $3,775,150

Technologies:

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		MONITORING	n/a
Groundwater		Yes	n/a
Surface Soil		No	n/a
Surface Water		Yes	n/a
Subsurface Soil		No	n/a
Sediment		No	n/a
Soil Gas		No	n/a
Air		No	n/a
Site Distance (One-way)		70	MI
Safety Level		D	n/a
Groundwater			
Required Parameters			
Average Sample Depth		50	FT
Samples per Event (First Year)		16	n/a
Samples per Event (Out Years)		16	n/a
Number of Events (First Year)		4	n/a
Number of Events (Out Years)		1	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	System Water - Low Level Radioactive	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Sampling Method	Existing Wells - Low Flow Pump	Existing Wells - Low Flow Pump	n/a
Number of Wells/Day	8	8	EA
Contain Purge Water	Yes	Yes	n/a
Surface Water			
Required Parameters			
Average Sample Depth		0	FT

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
Surface Water			
Required Parameters			
Samples per Event (First Year)		3	n/a
Samples per Event (Out Years)		3	n/a
Number of Events (First Year)		2	n/a
Number of Events (Out Years)		2	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	None	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Number of Samples/Day	8	8	EA
QA/QC			
Secondary Parameters			
Split Samples	1: 10	1: 10	EA
Field Duplicate Samples	1: 10	1: 10	EA
Rinse Blanks (per Round)	1	1	EA
Trip Blanks (per Day)	1	1	EA
Matrix Spikes/Matrix Spike Duplicates	1: 20	1: 20	EA
Data Management			
Secondary Parameters			
Monitoring Plan	Standard	Standard	n/a
Lab Data Review	Stage 2b	Stage 2b	n/a
Submit Data Electronically	Yes	Yes	n/a
Monitoring Reports	Abbreviated	Abbreviated	n/a

Comments: Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the capped areas. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, Semivolatile organic compounds (1,4-dioxane by single ion monitoring) Cam 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. Includes data validation, electronic data import, data management and monitoring reports.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M Drainage System
Description: Annual O&M of constructed storm water drainage control infrastructure.

Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	No	0	0

Total Marked-up Cost: $6,000

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	n/a
WBS Type		HTRW	n/a
Selected WBS		342.05.08	n/a
Safety Level		D	n/a

Comments: Assume annual maintenance costs of $6,000/year for lifetime of drainage system. Includes lined/capped CAMU detention basin, LFU-1 drainage swale, LFU-3 drainage channels. Present value cost for annual O&M of drainage channels. (Cost for this element expressed as annual cost only)

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M of Caps
Description: Operations and maintenance of multiple-layer capped areas. Assume top layer is vegetated.

Start Date: August, 2012
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Operations and Maintenance	Yes	40	60

Total Marked-up Cost: $1,122,241

Technologies:

Technology Name: **Operations and Maintenance**

Description	*Default*	*Value*	*UOM*
Labor			
Secondary Parameters			
Operations Labor: Type	Exclude from Estimate	Minimum	n/a
Professional Labor: Type	Exclude from Estimate	Minimum	n/a

Comments: Inspect, survey and repair CAMU cap for lifetime of alternative. Assumes some erosion and settlement, but no large scale failure.

Estimate Documentation Report

Technology Name: **Capping (# 1) - (O&M Parameters)**

Description	*Default*	*Value*	*UOM*
O&M Parameters			
Type of Cap		RCRA C (Hazardous Waste) Cap	n/a
Acres		6	AC
Surface Layer Type		Vegetated Layer	n/a

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Five-Year Reviews
Description: Five-Year Reviews for all technologies and controls implemented.

Start Date: March, 2015
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Five-Year Review	Yes	100	0

Total Marked-up Cost: $159,250

Technologies:

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Site Complexity		Low	n/a
Document Review		Yes	n/a
Interviews		Yes	n/a
Site Inspection		Yes	n/a
Report		Yes	n/a
Travel		No	n/a
Rebound Study		No	n/a
Start Date		March-2015	n/a
No. Reviews		6	EA
Document Review			
Required Parameters			
5-Year Review Check List		Yes	n/a
Record of Decision		Yes	n/a
Remedial Action Design & Construction		Yes	n/a
Close-Out Report		Yes	n/a
Operations & Maintenance Manuals & Reports		Yes	n/a
Consent Decree or Settlement Records		Yes	n/a
Groundwater Monitoring & Reports		Yes	n/a
Remedial Action Required		Yes	n/a
Previous 5-Year Review Reports		Yes	n/a
Interviews			
Required Parameters			
Current and Previous Staff Management		Yes	n/a
Community Groups		Yes	n/a
State Contacts		Yes	n/a
Local Government Contacts		Yes	n/a
Operations & Maintenance Contractors		Yes	n/a
PRPs		Yes	n/a
Remedial Design Consultant		Yes	n/a
Site Inspection			
Required Parameters			

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
Site Inspection			
Required Parameters			
General Site Inspection		Yes	n/a
Containment System Inspection		Yes	n/a
Monitoring Systems Inspection		Yes	n/a
Treatment Systems Inspection		Yes	n/a
Regulatory Compliance		Yes	n/a
Site Visit Documentation (Photos, Diagrams, etc.)		Yes	n/a
Report			
Required Parameters			
Introduction		Yes	n/a
Remedial Objectives		Yes	n/a
ARARs Review		Yes	n/a
Summary of Site Visit		Yes	n/a
Areas of Non Compliance		Yes	n/a
Technology Recommendations		Yes	n/a
Statement of Protectiveness		Yes	n/a
Next Review		Yes	n/a
Implementation Requirements		Yes	n/a

Comments: Inspect landfill areas for performance issues such as erosion or excessive settlement. Review and update all documents associated with compliance, performance, land use controls, and monitoring results. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews every five years for the lifetime of the alternative.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Periodic Storm Water Lift Station Repair
Description: Periodic costs associated with storm water lift station every ten years.

Start Date: August, 2020
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LIFT STATION PUMP REPLACEMENT	Yes	100	0

Total Marked-up Cost: $4,012

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LIFT STATION PUMP REPLACEMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LIFT STATION PUMP REPLACEMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		342.03.90	n/a
Safety Level		D	n/a

Comments: RACER assembly 33410101 Pump & Motor Cost = $892.37 x 3 lift stations. Assume cost incurred every ten years. Express cost as the one-time payment cost (in base year dollars). Present value over time cost is calculated outside of RACER.

ATTACHMENT F-6c

ALTERNATIVE SW-6 ASSEMBLY LEVEL REPORT

See file in Appendix F Folder titled 'Attachment_F-6c_SW-6_AssemblyLevelReport.xlsx'

ATTACHMENT F-7a

ALTERNATIVE SW-7 COST ASSUMPTIONS

ALTERNATIVE SW-7 COST ASSUMPTIONS

Attachment F-7a-1. Alternative SW-7 Description

Attachment F-7a-2. Planning and Oversight

Attachment F-7a-3. Biological Survey and Elderberry Shrub Cluster Relocation

Attachment F-7a-4. Decontamination Facilities

Attachment F-7a-5. Building Decommissioning and Demolition, Building Sampling and Analysis

Attachment F-7a-6. Building Decommissioning and Demolition, Building Demolition and Reconstruction

Attachment F-7a-7. Groundwater Monitoring Well Decommissioning

Attachment F-7a-8. Clearing and Grubbing

Attachment F-7a-9. Demolish LFU-3 Drainage Channel

Attachment F-7a-10. Excavation of LFU-1 Known PTW and Exploratory Trenches

Attachment F-7a-11. Excavation of LFU-2 Known PTW and Exploratory Trenches

Attachment F-7a-12. Excavation of Eastern Trenches

Attachment F-7a-13. Excavation of ET VOC “Hot Spot”

Attachment F-7a-14. Excavation of LFU-1 Drainage Area

Attachment F-7a-15. Excavation of LFU-2 VOC “Hot Spot”

Attachment F-7a-16. Excavation of LFU-3

Attachment F-7a-17. Excavation of ST and HSFDA

Attachment F-7a-18. Materials Management

Attachment F-7a-19. Excavated Materials Consolidation

Attachment F-7a-20. Off-Site Transportation and Disposal

Attachment F-7a-21. Install LFU-1 Multiple-layer Cap

Attachment F-7a-22. Install LFU-2/ET/WBH Multiple-layer Cap

Attachment F-7a-23. Install New Groundwater Monitoring Wells

Attachment F-7a-24. Storm Drainage Controls

Attachment F-7a-25. O&M: Institutional Controls

Attachment F-7a-26. O&M: Groundwater and Storm Water Monitoring

Attachment F-7a-27. O&M of Storm Water Drainage Infrastructure

Attachment F-7a-28. O&M of Multiple-layer Caps

Attachment F-7a-29. Periodic Costs: Five Year Reviews

Attachment F-7a-1. Alternative SW-7 Description - Cost Estimates, UC Davis LEHR/OCL

AlternativeSW-7. VOC "Hot Spot" Removal, Two On-Site Corrective Action Management Units with Multiple-Layer Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring
– See Section 5 of the FS - Volume 1 for a description of this alternative.

Alternative SW-7 Components Listed:

- Planning and oversight
- Biological Survey
- Elderberry Shrub Cluster Relocation
- Decontamination Facilities
- Building Decommissioning and Demolition
  - Building Sampling
  - Building Demolition and Reconstruction
- Groundwater Well Decommissioning
- Clearing and Grubbing
- Demolish/Backfill LFU-3 Drainage Channels
- Excavation of LFU-1 Known PTW and Exploratory Trenches
- Excavation of LFU-2 Known PTW and Exploratory Trenches
- ET Excavation - ET North and ET South
- ET VOC "Hot Spot," East and West Excavation
- LFU-1 Drainage Area Excavation
- LFU-2 VOC "Hot Spot" Excavation
- LFU-3 Excavation - LFU-3 Waste Cells
- Excavate ST and HFSDA
- Materials Management
- Excavated Materials Consolidation
- Off-Site Transportation and Disposal
- Install LFU-1 Multiple-Layer Cap
- Install LFU-2/ET/WBH Multiple-Layer Cap
- Install New Groundwater Wells
- Storm Drainage Controls
  - Storm Water Collection and Conveyance System
  - Installation of extended detention basin
  - Installation of vegetated swale along eastern edge of LFU-1
  - Redirect drainage ditch south along perimeter of LFU-3
  - Reconstruct LFU-3 north-south drainage channel
- Operations and Maintenance (O&M): Institutional Controls
- O&M: Groundwater and Storm Water Monitoring
- O&M of Storm Water Drainage Infrastructure
- O&M of Caps
- Periodic Costs: Storm Water Lift Station Repair (See O&M of Storm Water Drainage Infrastructure)
- Periodic Costs: Five Year Reviews

Planning and Oversight

Work planning, Health and Safety, Construction Quality Assurance/Quality Control Program, Construction Site Environmental Controls, Materials Management Plan (Table 5-1)

Costs for most planning and oversight are inclduded in RACER's "Professional Labor Management" cost sub-component and in professional labor cost assemblies.
These planning and oversight activities include:

Preparation and submittal of Contract-Required Deliverables
Preparation and submittal of project-specific planning documents (Work Plan, HASP, QAPP, materials management plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Sampling and Construction Quality Control Test Results
Health & Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Costs are estimated as a percentage of the calculated marked-up cost for a given remedial action component through "Professional Labor Management," or through professional labor assemblies included in the estimate for the remedial action cost component.

"Professional Labor Management" includes the costs of typical professional support activities associated with construction including preparation of site-specific construction activities, incidental permit acquisition, and contract-required deliverables. It also includes typical site-specific professional support activities associated with remedial action including evaluation of sampling and analysis data, comparison of results with project goals, coordination of field activities, and documentation and reporting of field activities. Each cost component has planning and oversight costs associated with it; where professional labor management is not specifically included as a cost sub-component, it is assumed that such cost estimates contain professional labor hours bundled with the cost for implementation of that cost component.

Attachment F-7a-3. Biological Survey and Elderberry Shrub Cluster Relocation - Cost Estimates, UC Davis LEHR/OCL

Biological Survey

Conduct a biological survey assessing selected plant, insect and animal species abundance, assess biotic diversity, and survey endangered/critical species' habitat.

Present findings in an biological survey report.

Elderberry Shrub Cluster Relocation

Elderberry shrub clusters located within areas potentially impacted by remediation will be relocated to the Russell Ranch Mitigation Area, as specified in the UC Davis Long Range Development Plan EIR Mitigation Measure 4.4-6(b).

Assume cost is $270,000 based on previous relocations.

Attachment F-7a-4. Decontamination Facilities - Cost Estimates, UC Davis LEHR/OCL

Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 36 weeks.

Equipment Decontamination Operation Length	36	weeks
(Assume construction will occur over nine months of the year)		
Average crew size	10	
Shifts	1	per day
Safety Level	Level D	

Attachment F-7a-5. Building Decommissioning and Demolition, Building Sampling and Analysis - Cost Estimates, UC Davis LEHR/OCL

Prior to implementation of the alternatives, nine Site buildings will be demolished and hazardous waste will be disposed off-Site. Non-hazardous material will be recycled, re-used, or disposed in an on-Site CAMU. It is assumed the buildings are contaminated with asbestos, lead, and PCBs. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated. Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. Assume 1 sample per 300 ft² of building surfaces. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals.

Total Building Surface Area	43,287	ft²
Number of samples	141	(see backup work below)
Sampling rate	75	samples/day
Crew Size	3	2 radiation technicians + 1 Health and Safety Officer

Analytical:	TCLP (RCRA) (EPA 1311)	H-292 and H-293 will also include:
	Testing, TAL metals (6010/7000s)	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total
	Pesticides/PCBs (SW 3550B/SW 8081/8082)	Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic
	Asbestos in Bulk Solids/Soils (Identification by PLM)	Testing, rad analytical vegetation/sediment/soil, gross alpha, total gas flow proportional counting

Two (2) Geriatrics Buildings (H-292 and H-293)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building Surface Area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	3,182	265	10	10
100	53	5,285	10	5	roof	5,305	442	16	6
					floor	5,285	5,285	196	6
					other building materials (assume 5% of building structure)	---	300	11	9
					Total	13,772	6,292	233	31

Five (5) Vacant Animal Housing Buildings (H-231,-232,-234,-236,-237)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	917	382	14	4
25	20	500	10	5	roof	502	42	2	1
					floor	500	500	19	1
					other building materials (assume 5% of building structure)		46	2	4
					Total	1,919	970	36	10

Storage Building at West Side of Landfill No. 3 (H-253)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	1,439	120	4	6
40	30	1,200	10	5	roof	1,205	100	4	4
					floor	1,200	1,200	44	4
					other building materials (assume 5% of building structure)		71	3	5
					Total	3,844	1,491	55	19

Co-60 Annex (H-290)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	1,039	87	3	4
30	21	630	10	5	roof	632	53	2	1
					floor	630	630	23	1
					other building materials (assume 5% of building structure)		38	1	4
					Total	2,302	808	30	10
					Grand Total (all buildings)	43,287	19,734	731	141

Demolish and dispose of buildings that must be removed to implement remedial action. Assume buildings are contaminated with asbestos, lead, and PCBs. Non-hazardous demolition waste will be disposed of in the on-Site CAMUs; hazardous waste will be sent off-Site for disposal.

Building

1 Demolish, dispose of Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

2 Demolish, dispose of Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

3

Demolish, dispose of Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

4

Demolish, dispose of Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

5

Demolish, dispose of Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

6

Demolish, dispose of Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²
Type of Building	concrete	
Number of stories	1	
Percent Hazardous Material	5%	
Height	12	ft

Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

7

Demolish, dispose of Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

8

Demolish, dispose of storage building near northwest corner of Landfill No. 3 (H-253). Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	1,200	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	64	CY	
Volume Hazardous	3	CY	
Safety Level	Level D		

9 Demolish, dispose of Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	630	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	33	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

Note: A new building will be constructed to replace buildings H-253 and H-290. The replacement is assumed to be 1,830 square feet.

Total Volume of Non-Hazardous Building Demolition Waste to Dispose of Off-Site

0 CY

Total Volume of Hazardous Building Demolition Waste to Dispose of Off-Site

45 CY

Building Reconstruction Costs

Three warehouse buildings will be constructed. Two will be replacements for the Geriatrics buildings, H-292 and H-293, the third is to replace buildings, H-253 and H-290. Cost estimates are based on phone conversation with representative from Allied Steel (12/20/2010) and estimates from Rex Moore Electrical Contractors (12/22/2010) and J.W. McClenahan Company plumbing contractors (1/3/2011). Estimates include engineering, design, and construction. 20% contingency to be added to account for additional cost elements.

1,830 SF warehouse:

Building design and construction (with concrete foundation): $30,000	Dimensions: 35’ x 55’ x 10’	Distance to potable water main = 50 feet
Electrical: $16,031	1 restroom (toilet + sink)	Distance to sanitary sewer = 200 feet
Plumbing: $18,000	1 industrial sink	Distance to electrical distribution = 100 feet
Estimated Cost = $34.99/SF		

5,285 SF warehouse:

Building design and construction (with concrete foundation): $70,000	Dimensions: 53’ x 100’ x 10’	Distance to potable water main = 50 feet
Electrical: $27,214	1 restroom (toilet + sink)	Distance to gas = 100 feet
Plumbing: $47,250	2 industrial sinks	Distance to sanitary sewer = 300 feet
Estimated Cost = $27.34/SF	natural gas connection	

Decommission the following wells (Table 5-3):

Well	Total Boring Depth (ft bgs)	Well Diameter (inches)	Well Screen Type
DDC-1*	85.5	15	PVC
DDC-2*	80	15	PVC
DDC-3*	80	15	PVC
TP-1*	80	15	PVC
TP-2*	79	12.25	PVC
TP-3*	80.5	12.25	PVC
TP-4*	80.5	12.25	PVC
TP-5*	80	12.25	PVC
UCD1-008	56	2	PVC
UCD1-009	51.5	2	PVC
UCD1-012	65	4	PVC
UCD1-013	65	4	PVC
UCD1-050	69.5	4	Stainless Steel
UCD1-051	70	4	Stainless Steel
UCD2-014	86	4	PVC

* If nested well, value is the borehole diameter.

Attachment F-7a-8. Clearing and Grubbing - Cost Estimates, UC Davis LEHR/OCL

Clear and Grub	Clear all trees and vegetation within footprint of excavation/cap. Used current satellite photo and photographs from recent field activities to estimate amount of vegetation to clear. Assumed all removed material will be stored on-Site for re-use.	
LFU-1	Disposal	on-site, chipped
	ACRES	2.4 AC
	FLORA DENSITY	light; 5 trees per acre
LFU-2/ET/WBH	Disposal	on-site, chipped
	ACRES	3.5 AC
	FLORA DENSITY	light; 15 trees per acre
LFU-3	Disposal	on-site, chipped
	ACRES	1.0 AC
	FLORA DENSITY	light; 10 trees per acre
ST/HFSDA	Add to LFU-2/ET/WBH clearing and grubbing cost element	
	Disposal	on-site, chipped
	ACRES	0.4 AC
	FLORA DENSITY	light; 15 trees per acre

Attachment F-7a-9. Demolish LFU-3 Drainage Channel - Cost Estimates, UC Davis LEHR/OCL

Description:

Demolish the LFU-3 N-S concrete lined drainage channel. The drainage area will be re-constructed in its original location post-remediation, but will have a vegetated lining instead of concrete.
The E-W drainage ditch will be destroyed/backfilled during remediation. It will be re-routed south of the LFU-3 area after remediation.

Major Assumptions:

Estimate the volume of concrete to be removed in demolition of Landfill Unit No. 3 N-S drainage channel:

Length (total)	270	ft
Length (portion to be demolished)	270	ft
Top Width of channel	30	ft
Bottom Width of channel	16	ft
Depth	7	ft
Thickness of concrete	0.17	ft
Length of side wall	9.90	ft
Volume of channel concrete to remove	1,626	ft^3
	60	CY

Estimated backfill for the current E-W channel in the footprint of the proposed cap:

Length	100	ft	
Top Width of channel	9	ft	
Bottom Width of channel	3	ft	
Depth	3	ft	
Volume to backfill:	2,700	ft^3	
	100	CY	
	140	**CY**	**bulk factor applied**

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in LFU-1. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate Exploratory Trenches

LFU-1 TRL-35			
Volume		137	BCY
Avg. Depth		7	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-1 TRL-36			
Volume		55	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU1-T1			
Volume		38	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T2			
Volume		40	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T3			
Volume		41	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	7	
LFU1-T4			
Volume		57	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	10	
LFU1-T5			
Volume		69	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	11	
LFU1-T6			
Volume		83	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	13	
LFU1-T7			
Volume		80	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	13	
Total Volume Excavated -LFU-1 PTW Trenches		838	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level D	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	838	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Conduct geophysical survey.
Excavate trenches with known PTW and proposed exploratory trenches in LFU-2. Backfill with non-PTW material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate Exploratory Trenches

LFU-2 TRL-12			
Volume		11	BCY
Avg. Depth		8	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-2 TRL-22			
Volume		48	BCY
Avg. Depth		15	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU-2 TRL-20			
Volume		11	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	none; excavation is occurring to remove PTW		
LFU2-T1			
Volume		174	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	19	
LFU2-T2			
Volume		174	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	19	
LFU2-T3			
Volume		132	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	15	
LFU2-T4			
Volume		132	BCY
Avg. Depth		11	FT
Source of backfill	On-Site		
Number of confirmation samples	Collect 1 confirmation sample every 10 feet from the trench wall and floor, plus one from each end wall of trench	15	
Total Volume Excavated		953	LCY
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	953	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of trench excavations. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Excavate ET North and ET South to 8 feet bgs.
Dispose of excavated PTW off-Site. Backfill ET South with non-PTW material; backfill ET North with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET North

Volume		1,171 BCY
Avg. Depth		8 FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Number of composites	default	
Analytical	Testing, TAL metals (6010/7000s)	283.5038 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.8053 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.8146 $/sample
	Testing, purgeable organics (624, 8260)	138.9465 $/sample
	Testing, semi-volatile organics (625, 8270)	465.8413 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99141 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65099 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.5861 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Off-Site Backfill Required		1,639 LCY
Safety Level		Level C

Excavate ET South

Volume		4,799 BCY
Avg. Depth		8.0 FT
Source of backfill	On-Site	
Number of confirmation samples	None, excavated area part of capped CAMU	
Off-Site Backfill Required		0 LCY
Safety Level		Level C

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety level C.

Load and Haul

Volume	8,358 LCY
One Way Haul Distance	500 FT

Land Survey of Excavation

Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-7a-13. Excavation of ET VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate ET VOC "Hot Spot," east and west to depth of 20 feet bgs.
Dispose of excavated hazardous material off-Site. For ET VOC "Hot Spot," east backfill and compact with clean fill. For ET VOC "Hot Spot," west backfill and compact with non-hazardous excavated material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET VOC "Hot Spot," East

Volume		713	BCY
Avg. Depth		20	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		998	LCY
Safety Level		Level C	

Excavate ET VOC "Hot Spot," West

Volume		492	BCY
Avg. Depth		20	FT
Source of backfill	On-Site		
Number of confirmation samples	None, excavated area part of capped CAMU		
Percent to be used as backfill (on-Site)		100	%
Off-Site Backfill Required		0	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,686	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of ET VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-7a-14. Excavation of LFU-1 Drainage Area - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-1 Drainage Area to ten feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-1 Drainage Area

Volume	7,215	BCY
Avg. Depth	10	FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Analytical		
Testing, TAL metals (6010/7000s)	283.50	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
Testing, purgeable organics (624, 8260)	138.95	$/sample
Testing, semi-volatile organics (625, 8270)	465.84	$/sample
Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Off-Site Backfill Required	10,100	LCY
Safety Level	Level D	

Load and Haul

Volume	10,100	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Land Survey of Excavation

Survey boundaries of Landfill Unit No. 1 Drainage Area excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-7a-15. Excavation of LFU-2 VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-2 VOC "Hot Spot" to depth of 20 feet bgs. Backfill non-hazardous material in excavation.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate LFU-2 VOC "Hot Spot"

Volume		1,210 BCY
Avg. Depth		20 FT
Source of backfill	On-Site	
Number of confirmation samples	None, excavated area part of capped CAMU	
Percent to be used as backfill (On-Site)		100 %
Off-Site Backfill Required		0 LCY
Safety Level		Level C

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,693 LCY
One Way Haul Distance	500 FT

Land Survey of Excavation

Survey boundaries of LFU-2 VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-7a-16. Excavation of LFU-3 - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-3 Waste Cells to ten feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-3 Waste Cells:

Volume		9,920 BCY
Avg. Depth		10 FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	default	
Number of composites	default	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		13,889 LCY
Safety Level		Level D

Load and Haul

Volume	13,889 LCY
One Way Haul Distance	500 FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Land Survey of Excavation

Survey boundaries of excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency

radiological work	15 %

Excavate the ST and HFSDA. Backfill the excavations with clean fill.
Segregate and dispose of the PTW off-Site and dispose of non-PTW material in the on-Site capped CAMUs.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate ST

Volume		1,562 BCY
Avg. Depth		6 FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	default, 1 per 625 ft² (25 ft x 25 ft grid)	
Number of composites	default	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		2,186 LCY
Safety Level		Level D

Excavate HFSDA

Volume		461 BCY
Avg. Depth		6 FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	default, 1 per 625 ft² (25 ft x 25 ft grid)	
Number of composites	default	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		646 LCY
Safety Level		Level D

Load and Haul

Load and haul ST and HFSDA soil and waste to stockpiling areas. Assume stockpile area is to the north of ST, assume 500 feet transport distance.

Excavated volume	2,832 LCY
One Way Haul Distance	500 FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety level C.

Land Survey of Excavation

Survey boundaries of ST and HFSDA excavations. 3 man survey crew - 2 half-days. Licensed surveyor report.

Contingency	radiological work	15 %

Attachment F-7a-18. Materials Management - Cost Estimates, UC Davis LEHR/OCL

Materials management includes activities related to the management of excavated soil and solid waste (i.e., stockpiling, sifting/sorting, waste characterization, and staging prior to final disposal).

Bulk Material Storage

Accommodate total excavated volume (TEV) across all subareas to allow for sorting, waste characterization, and staging. Stockpile excavated material in bermed, covered storage area.
Safety Level D.

TEV (from subareas excavated under this alternative)	40,349	LCY

Sifting of Excavated Material

Assume rate of sifting = 200 CY/day

Assume the use of similar equipment used under the MEC Sifting assembly. Material will be segregated into PTW, biological waste, and LTW waste streams. Safety Level C.

Soil/solid waste volume (PTW, biological waste, and LTW waste streams):	27,803	LCY
Trommel Screener	7	month
Grizzly Shaker Unit	7	month
Conveyors,	1	unit
Refuse Bottom Hopper	1	unit
5'x16' Double tray Vibrating Screening Unit	1	unit
Two full-time equipment operators, oilers (per screening operation)	2,322	hrs

Loader for Staging Area

One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled material needs to be moved. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

950, 3.0 CY, Wheel Loader (active)	700	hours
950, 3.0 CY, Wheel Loader (standby)	700	hours
Bobcat with Backhoe	7	month
All Terrain Forklift (Monthly Rental)	7	month

Waste Characterization

Assume the included materials and analyses for waste characterization prior to final disposal of excavated materials. (ET PTW and ET VOC Hotspot excavated material) 1 sample per 300 CY.

Material to be characterized:	PTW + VOC "Hot Spot" TEV	
Total Volume	3,751	LCY
Sampling rate	1	sample/300 CY (or 1 sample per container)
Number of samples	13	
Analytical suite:		
Testing, TAL metals (6010/7000s)	257.73	$/sample
TCLP (RCRA) (EPA 1311), Soil Analysis	120.30	$/sample
Testing, soil & sediment analysis, BTEX/gasoline hydrocarbons mod EPA 8020 (PID/FIFD)	107.37	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	234.37	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	278.01	$/sample
Purgeable organics (624, 8260)	126.31	$/sample
Testing, semi-volatile organics, pkd. column (8250)	416.14	$/sample
Testing, paint filter liquids test (9095)	27.90	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, ignitibility (1010)	31.64	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, corrosivity (1110, NACE)	26.04	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, reactivity (cyanide/sulfide)	72.65	$/sample
Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic	133.34	$/sample
Testing, rad analytical, additional services, characterization of any unknown rad sample (low level)	194.36	$/sample

Drum Staging

Drums for PTW laboratory waste (lab pack) disposal. Includes characterization of wastes in drums. Assume number of drums = volume of PTW in LCY divided by four. Safety Level C.

Total PTW	387	LCY
Store PTW in bulk containers	14	containers (30 CY capacity)
Number of drums	97	drums
Percentage Full	65	%
Temporary Storage Area	1,128	ft²
Overpacks	85 gal. steel salvage drum	
Waste characterization	1 sample per drum, liquid waste characterization template	

Attachment F-7a-19. Excavated Materials Consolidation - Cost Estimates, UC Davis LEHR/OCL

CAMU	Volume to Consolidate [LCY]
LFU-1 CAMU	9,550
LFU-2 CAMU	16,242

Attachment F-7a-20. Off-Site Transportation and Disposal - Cost Estimates, UC Davis LEHR/OCL

	LLRW (LCY)	**Mixed Waste** (LCY)	**RCRA Hazardous** (LCY)	**Non-RCRA Hazardous** (LCY)	**Non-Hazardous** (LCY)	**Building Hazardous** (LCY)	**Building Non-Hazardous** (LCY)	**Drums/Lab Pack** (number of drums)
Distance to disposal facility	594 miles	594 miles	227 miles	227 miles	93 miles	227 miles	93 miles	594 miles
Volume*	1,374	87	970	276	1,798	45	0	
Volume for Incineration**	0	0	0	0	0	0	0	
Final Disposal Volumes	**1,374**	**87**	**970**	**276**	**1,798**	**45**	**0**	**97**

* See Table E-13 (Appendix E, FS - Volume 1).
** Biological waste only.

Attachment F-7a-21. Install LFU-1 Multiple-layer Cap - Cost Estimates, UC Davis LEHR/OCL

Description: Construct multiple-layer cap over LFU-1.

Major Assumptions:

Area:	2.0	acres	
Thickness:	3.5	ft	
Side slope:	3:1		(maximum)
Layers:			

vegetative cover	6	inches
protection layer (clean fill/soil)	24	inches
Drainage layer (geocomposite)	-	inches
40 mil HDPE geomembrane	-	inches
Compacted Clay Layer (geocomposite clay lin	-	inches
foundation soil layer	12	inches
waste material		

Capacity of CAMU to receive waste on top of current grade and underneath cap:
9,550 CY

Volume to compact (above grade and underneath cap):
9,550 LCY

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foundation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetative cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 half-days. Licensed surveyor report.

Attachment F-7a-22. Install LFU-2/ET/WBH Multiple-layer Cap - Cost Estimates, UC Davis LEHR/OCL

Description: Construct multiple-layer cap over the LFU-2/ET/WBH.

Major Assumptions:

Area:	3.4	acres	
Thickness:	3.5	ft	
Side slope:	3:1	(maximum)	
Layers:			

vegetative cover	6	inches
protection layer (clean fill/soil)	24	inches
Drainage layer (geocomposite)	-	inches
40 mil HDPE geomembrane	-	inches
Compacted Clay Layer (geocomposite clay liner)	-	inches
foundation soil layer	12	inches
waste material		

Capacity of CAMU to receive waste on top of current grade and underneath cap:

16,242 CY

Volume to compact (above grade and underneath cap):

16,242 LCY

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foundation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetative cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 half-days. Licensed surveyor report.

Attachment F-7a-23. Install New Groundwater Wells - Cost Estimates, UC Davis LEHR/OCL

Groundwater Well Installation - Nine HSU-1 groundwater monitoring wells and one HSU-2 groundwater monitoring well would be installed. The wells will have screen/sand pack intervals of seven feet or less to minimize their potential to act as vertical conduits for downward COC migration, and will be completed just below the bottom of the depth range of seasonal water table fluctuation. In addition, it is assumed that three density-driven convection (DDC) wells and three nested piezometers would be installed as replacements for those decommissioned in the ET North.

9 HSU-1 wells, 70 ft depth, 2" diameter, PVC Schedule 80
1 HSU-2 well, 105 ft depth, 4" diameter, PVC Schedule 80
3 DDC wells, 90 ft depth, 15" diameter borehole. Each DDC well assumed to include:
- Recirculating well: 90 ft depth, 4" diameter, PVC Schedule 80
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 30 ft depth
  - Intermediate: 52 ft depth
  - Deep: 76 ft depth
- Air Injection Tubing: 90 ft depth + 35 feet to blower, 1.25" diameter, PVC Schedule 80
- Vapor Return Line: 50 feet to discharge pipe, 2" diameter, PVC Schedule 80
- Acid Drip Line: 50 feet to acid storage, 0.75" diameter, PVC Schedule 80

3 Sets of Nested Piezometers, 80 ft depth, 15" diameter borehole. Each set of piezometers assumed to include:
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 35 ft depth
  - Intermediate: 53 ft depth
  - Deep: 80 ft depth

Dispose drill cuttings as non-hazardous waste
Survey and develop completed wells

Attachment F-7a-24. Storm Drainage Controls - Cost Estimates, UC Davis LEHR/OCL

LFU-1 Storm Drainage

North-south trending vegetated swale will be constructed to east of LFU-1 cap.

Lining:	soil/vegetation	
Length	400	feet
Erosion Controls - Geotextile	326	yd^2
Erosion Controls - Rip-rap	24	CY

LFU-3 N-S Drainage Channel

North-south trending concrete-lined drainage channel will be reconstructed to match original dimensions.

Length	270	ft
Top Width	30	ft
Bottom Width	16	ft
Depth	7	ft
Length of north-south drainage channel to reconstruct	270	ft
Lining	soil/vegetation	
Erosion Controls - Geotextile	652	yd^2
Erosion Controls - Rip-rap	64	CY

LFU-3 E-W Drainage Ditch

Re-route the east-west vegetated drainage ditch to the south of LFU-3. Install new culvert to discharge into north-south, concrete-lined drainage channel.

Lining:	soil/vegetation	
Length	260	ft
Top Width	15	ft
Depth	3	ft
Erosion Controls - Geotextile	212	yd^2
Erosion Controls - Rip-rap	16	CY

LFU-1/LFU-2/ET/WBH Collection and Conveyance System, Lift Station and Extended Detention Basin

Size Basin					
(d) Depth	4	ft	Area HDPE liner	7,850	ft^2
(l) Length	85	ft			
(w_b) Bottom Width	20	ft			
(w_t)Top Width	45	ft			
(V) Volume	11,050	ft^3			
	409	CY			
Length of piping:					
to detention basin	2,500	ft			
discharge from basin	630	ft			
Number of lift stations:	2				

One north of LFU-2 to pump water to detention basin, one east of detention basin to pump toward discharge at LFU-1.

Peak flow:	0.35	cfs

Survey :

Survey newly constructed drainage channels and detention basins. 2 half-days. Registered surveyor report.

Attachment F-7a-25. O&M: Institutional Controls - Cost Estimates, UC Davis LEHR/OCL

Perform initial survey to establish legal boundaries of Site.
Implement and maintain land use controls.
Document waste placement locations and prohibit site development or activities incompatible with designated land use.

		# meetings	# people	# days	airfare	mileage to meeting site
Planning Documents	LUC Assurance Plan	2	2	1	0	70
	LUC Implementation Plan	2	2	1	0	70
	Construction Permitting	1	1	1	0	70
	Geographic Information Systems/Overlay Maps	1	1	1	0	70
Implementation	Deed Notification	1	unit			
	Restrictive Covenants	1	unit			
	Access Control Signs	22	unit	Assume one sign every 150 feet around perimeter of land disposal units		
	Utility Notification Service	1	unit			
	GIS/Overlay maps	1	unit			
Monitoring and Enforcement						
	Duration of monitoring/enforcement	100	YRS (or lifetime of alternative)			
	Reports & Certifications	1	per year			
	Site Visits/Inspections	1	per year			
Survey:	5 days, licensed surveyors' report					

Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the land disposal units according to Table 5-3. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, semivolatile organic compounds (1,4-dioxane by single ion monitoring) CAM 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three designated storm water sampling locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. The groundwater and storm water monitoring period will continue throughout the lifetime of the alternative until Site cleanup goals are achieved.

Includes data validation, electronic data import, data management and monitoring reports.
16 wells to be included.

Attachment F-7a-27. O&M of Storm Water Drainage Infrastructure - Cost Estimates, UC Davis LEHR/OCL

Assume annual maintenance costs of $4,000/year for lifetime of drainage system.

Includes detention basin and associated infrastructure, LFU-1 drainage swale, LFU-3 drainage channels

Periodic costs incurred every ten years for repair/replacement of lift station pumps (2 lift stations).

Attachment F-7a-28. O&M of Multiple-layer Caps - Cost Estimates, UC Davis LEHR/OCL

Inspect and repair caps for lifetime of cap. Assumes some erosion and settlement, but no large scale failure. RACER bases costs on total area of caps.

Total Capped Area:	5.33	acres

Attachment F-7a-29. Periodic Costs: Five Year Reviews - Cost Estimates, UC Davis LEHR/OCL

Review and update all documents associated with compliance, performance, land use controls. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews for period of 30 years.

Document Review

Interviews	Current and Previous Staff Management
	Community Groups
	State Contacts
	Local Government Contacts
	Operations & Maintenance Contractors
	PRPs
	Remedial Design Consultant
Site Inspection	General Site Inspection
	Containment System Inspection
	Monitoring Systems Inspection
	Treatment Systems Inspection
	Regulatory Compliance
	Site Visit Documentation (Photos, Diagrams, etc.)
Report	

ATTACHMENT F-7b

ALTERNATIVE SW-7 ESTIMATE DOCUMENTATION REPORT

Estimate Documentation Report

System:

RACER Version: 10.3.0
Database Location: C:\Documents and Settings\gch\Application Data\AECOM\RACER 10.3\Racer.mdb

Folder:

Folder Name: Alternative SW-7

Project:

Project ID: FS_Cost
Project Name: Feasibility Study Cost Estimate
Project Category: Detailed Analysis of FS Alternatives

Location
State / Country: CALIFORNIA
City: SACRAMENTO

Location Modifier	Default	User
	1.203	1.203

Options
Database: Modified System
Cost Database Date: 2010
Report Option: Calendar

Description
Cost estimates in support of the CERCLA Feasibility Study for University of California, Davis areas of responsibility at the Laboratory for Energy-Related Health Research/Old Campus Landfill Site. Use Modified System Costs to add custom cost assemblies.

Estimate Documentation Report

Site Documentation:

Site ID: LEHR/OCL
Site Name: Alternative SW-7
Site Type: Land Disposal Units

Media/Waste Type

Primary: Soil
Secondary: N/A

Contaminant

Primary: Multi-Contaminant
Secondary: Radioactive (Low Level)

Phase Names

Pre-Study:
Study:
Design:
Removal/Interim Action:
Remedial Action:
Operations & Maintenance:
Long Term Monitoring:
Site Closeout:

Documentation

Description: Alternative SW-7. VOC "Hot Spot" Removal, Two On-Site Corrective Action Management Units with Multiple-Layer Caps, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring.

See Section 5 of the FS for a description of this alternative.

Support Team: Weiss Staff
References: RACER 2010 System Costs Database

Estimate Documentation Report

Estimated Costs:

Phase Names	Direct Cost	Marked-up Cost
Biological Survey	$34,759	$86,304
Decontamination Facilities	$263,219	$582,436
Institutional Controls	$445,672	$1,039,283
Building D&D	$212,542	$314,966
Elderberry Mitigation	$270,000	$270,000
Clearing and Grubbing	$29,533	$54,151
Decommission GW Monitoring Wells	$440,895	$624,402
ET Excavation	$166,897	$273,170
ET VOC "Hot Spot" Excavation	$112,789	$181,700
LFU-1 Drainage Area Excavation	$376,788	$609,893
Materials Management	$1,268,415	$2,143,896
Demolish LFU-3 N-S Drainage Channel	$6,850	$10,264
LFU-1 PTW and Exploratory Trench Excavation	$193,726	$278,207
LFU-2 PTW and Exploratory Trench Excavation	$205,478	$300,782
Excavated Material Consolidation	$51,806	$87,682
LFU-2 VOC "Hot Spot" Excavation	$29,213	$47,289
LFU-3 Excavation	$547,716	$893,073
ST and HFSDA Excavation	$134,585	$206,155
LFU-1 Cap	$685,354	$1,113,709
LFU-2/ET/WBH Cap	$1,138,051	$1,861,724
LFU-3 Drainage Channels	$50,707	$91,539
Off-Site Transportation and Disposal	$2,154,907	$2,590,911
Install New GW Monitoring Wells	$206,121	$297,551
LFU-1 Drainage Swale	$10,442	$18,841
Storm Drainage	$297,668	$474,347
Building Reconstruction	$423,616	$423,616
Groundwater and Storm Water Monitoring	$2,799,569	$3,775,150
O&M Drainage System	$4,000	$4,000
O&M of Caps	$510,662	$1,018,340
Five-Year Reviews	$63,558	$159,250
Periodic Storm Water Lift Station Repair	$1,785	$2,674
Total Cost:	$13,137,322	$19,835,305

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Biological Survey
Description: Perform biological survey of Site prior to remedial action to assess population abundance and diversity of selected plant and animal species.

Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
RCRA Facility Investigation	Yes	100	0

Total Marked-up Cost: $86,304

Technologies:

Estimate Documentation Report

Technology Name: **RCRA Facility Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		No	n/a
Other Investigations		No	n/a
Site Distance		70	MI
Site Complexity		Low	n/a
Site Charact.			
Required Parameters			
Fieldwork Support		No	n/a
Evaluate Site Geology/Hydrogeology		No	n/a
Evaluate Site Soils/Surface Hydrology		No	n/a
Evaluate Site Meteorology		No	n/a
Evaluate Populations and Land Usage		No	n/a
Evaluate Site Ecology		Yes	n/a
Evaluate Nature and Extent of Contamination		No	n/a
Evaluate Contaminant Fate and Transport		No	n/a
Conduct Baseline Risk Assessment		No	n/a
Compose RFI Report		Yes	n/a

Comments: On-Site biological survey with particular emphasis on threatened and endangered species prior to commencement of any remedial activities.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Institutional Controls
Description: Implement and maintain Institutional/Land Use Controls to prohibit Site development or activities incompatible with designated land use.

Approach: In Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
INITIAL LAND SURVEY	Yes	5	95
ADMINISTRATIVE LAND USE CONTROLS	Yes	100	0

Total Marked-up Cost: $1,039,283

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **INITIAL LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		INITIAL LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew to establish legal boundaries defining the Site's boundaries. Licensed surveyor report. 3 man survey crew - 5 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Rename Model		ADMINISTRATIVE LAND USE CONTROLS	n/a
Planning Documents		Yes	n/a
Planning Documents: Start Date		2010	n/a
Implementation		Yes	n/a
Implementation: Start Date		2010	n/a
Monitoring & Enforcement		Yes	n/a
Monitoring & Enforcement: Start Date		2010	n/a
Modification/Termination		No	n/a
Type of Site		Former Government Site	n/a
Planning Documents			
Required Parameters			
LUC Assurance Plan (LUCAP)		Yes	n/a
LUC Assurance Plan (LUCAP): Plan Complexity		Medium	n/a
LUC Implementation Plan (LUCIP)		Yes	n/a
LUC Implementation Plan (LUCIP): Number		1	EA
LUC Implementation Plan (LUCIP): Plan Complexity		Medium	n/a
Long-term Stewardship (LTS) Plan		No	n/a
Memorandum of Agreements (MOA)		No	n/a
Installation (or City) Master Plan		No	n/a
Construction Permitting		Yes	n/a
Construction Permitting: Number		1	EA
Construction Permitting: Plan Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Plan Complexity		Low	n/a
Planning Meetings			
Required Parameters			
LUCAP: Number of Meetings		2	EA
LUCAP: Number of People		2	EA

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Planning Meetings			
Required Parameters			
LUCAP: Number of Days		1	EA
LUCAP: Airfare Cost		0	$
LUCAP: Mileage to Meeting Site		70	MI
LUCIP: Number of Meetings		2	EA
LUCIP: Number of People		2	EA
LUCIP: Number of Days		1	EA
LUCIP: Airfare Cost		0	$
LUCIP: Mileage to Meeting Site		70	MI
Construction Permitting: Number of Meetings		1	EA
Construction Permitting: Number of People		1	EA
Construction Permitting: Number of Days		1	EA
Construction Permitting: Airfare Cost		0	$
Construction Permitting: Mileage to Meeting Site		70	MI
GIS/Overlay Maps: Number of Meetings		1	EA
GIS/Overlay Maps: Number of People		1	EA
GIS/Overlay Maps: Number of Days		1	EA
GIS/Overlay Maps: Airfare Cost		0	$
GIS/Overlay Maps: Mileage to Meeting Site		70	MI
Implementation			
Required Parameters			
Modify Installation (or City) Master Plan		No	n/a
Deed Notification		Yes	n/a
Deed Notification: Number		1	EA
Deed Notification: Task Complexity		Low	n/a
Negotiating Easements		No	n/a
Restrictive Covenants		Yes	n/a
Restrictive Covenants: Number		1	EA
Restrictive Covenants: Task Complexity		Low	n/a
Equitable Servitudes		No	n/a
Access Control Signs		Yes	n/a

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Implementation			
Required Parameters			
Access Control Signs: Number		22	EA
Access Control Signs: Task Complexity		Low	n/a
Utility Notification Service		Yes	n/a
Access Control Signs: Number		1	EA
Access Control Signs: Task Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Task Complexity		Low	n/a
Develop Finding of Suitability to Transfer (FOST)		No	n/a
Monitoring & Enforcement			
Required Parameters			
Duration of Monitoring/Enforcement		31	Years
Notice Letters		No	n/a
Guard Service/Security		No	n/a
Reports & Certifications		Yes	n/a
Reports & Certifications: Frequency		Annually	n/a
Site Visits/Inspections		Yes	n/a
Site Visits/Inspections: Number		1	EA
Site Visits/Inspections: Safety Level		D	n/a
Site Visits/Inspections: Duration		1	Days
Site Visits/Inspections: Number of People		2	EA
Site Visits/Inspections: Frequency		Annually	n/a
Site Visits/Inspections: Airfare		0	$ Per Ticket
Site Visits/Inspections: Mileage		70	MI

Comments: Implement and maintain land use controls to prohibit Site development or activities incompatible with designated land use.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decontamination Facilities
Description: Provide decontamination facilities for equipment and personnel throughout duration of the remedial action.

Approach: Ex Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Decontamination Facilities	Yes	100	0

Total Marked-up Cost: $582,436

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		554,701	$
Percentage	19	5	%
Dollar Amount		27,735	$

Comments:

Estimate Documentation Report

Technology Name: **Decontamination Facilities (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
New Decontamination Facility Pad Construction		No	n/a
Equipment Rating		n/a	n/a
Equipment Decontamination Operations		Yes	n/a
Equipment Decontamination Operations: Duration		36	weeks
Personnel Decontamination Trailers		Yes	n/a
Personnel Decontamination Trailers: Average Crew Size		10	per shift
Personnel Decontamination Trailers: Duration		36	weeks
Safety Level		D	n/a
Work Shifts			
Secondary Parameters			
Equipment Decontamination	One Shift per Day		n/a
Personnel Decontamination	One Shift per Day		n/a

Comments: Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 36 weeks.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Elderberry Mitigation
Description: Identify elderberry shrub clusters within work boundaries and relocate them within UC boundaries.

Approach: None
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ELDERBERRY SHRUB CLUSTER RELOCATION	No	0	0

Total Marked-up Cost: $270,000

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **ELDERBERRY SHRUB CLUSTER RELOCATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ELDERBERRY SHRUB CLUSTER RELOCATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.02	n/a
Safety Level		D	n/a

Comments: Cost for Elderberry mitigation based on previous transplanting operations at UC Davis.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building D&D
Description: Prior to implementation of the alternative, nine Site buildings will be demolished and associated hazardous demolition material will be disposed off-Site. It is assumed that five percent of the demolition waste is contaminated with asbestos, lead, and PCBs. Non-hazardous building material will be recycled or disposed of in an on-Site CAMU. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated.
Apply 15% contingency for worker safety and additional waste volume.

Approach: Ex Situ
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Professional Labor Management	Yes	100	0
D&D, Sampling and Analysis	Yes	100	0

Total Marked-up Cost: $314,966

Technologies:

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		630	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		33.25	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		1.75	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		1,200	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		63.65	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		3.35	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose storage building (H-253) near northwest corner of Landfill No. 3. Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		191,492	$
Percentage	19.8	19.8	%
Dollar Amount		37,915	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Mobilizations		1	EA
Mobilization Distance		70	MI (One-way)
Soil/Sediment: # of Samples		0	EA
Soil/Sediment: Survey Area		0	SF
Water/Liquid: # of Samples		0	EA
Water/Liquid: Survey Area		0	SF
Building Surfaces: # of Samples		141	EA
Building Surfaces: Survey Area		43,287	SF
Sampling Rate		75	Per Day
Sampling Crew Size		2 Radiation Technicians, 1 Health and Safety Officer	n/a
Safety Level		D	n/a
Laboratory Analyses			
Required Parameters			
Soil: Alpha		No	n/a
Soil: Beta		No	n/a
Soil: Gamma		No	n/a
Soil: VOC"s		No	n/a
Soil: SVOC"s		No	n/a
Soil: Fuels		No	n/a
Soil: Pesticides		No	n/a
Soil: PCB"s		No	n/a
Soil: Metals		No	n/a
Soil: Acids/Caustics		No	n/a
Soil: Ordnance Residual		No	n/a
Water: Alpha		No	n/a
Water: Beta		No	n/a
Water: Gamma		No	n/a
Water: VOC"s		No	n/a
Water: SVOC"s		No	n/a

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Laboratory Analyses			
Required Parameters			
Water: Fuels		No	n/a
Water: Pesticides		No	n/a
Water: PCB"s		No	n/a
Water: Metals		No	n/a
Water: Acids/Caustics		No	n/a
Water: Ordnance Residual		No	n/a
Building: Alpha		No	n/a
Building: Beta		No	n/a
Building: Gamma		No	n/a
Building: VOC"s		No	n/a
Building: SVOC"s		No	n/a
Building: Fuels		No	n/a
Building: Pesticides		No	n/a
Building: PCB"s		Yes	n/a
Building: Metals		Yes	n/a
Building: Acids/Caustics		No	n/a
Building: Ordnance Residual		No	n/a
QA Blanks: Soil/Sediment		0	%
QA Blanks: Water/Liquid		0	%
QA Blanks: Building		15	%
Hand Scanning		1	Days
Adjustments/Productivity			
Secondary Parameters			
Turnaround Time		Standard (21 Days)	n/a
Quality Control		Level 1	n/a
Height Adjustment	15	15	%
Protective Clothing	23	23	%
RADCON	15	15	%
Respiratory Protection	38	38	%
Breaks	10	10	%

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Adjustments/Productivity			
Secondary Parameters			
Productivity Loss Multiplier	2.32	n/a	n/a

Comments: Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. One sample per ~300 ft2. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals. At two Geriartics Buildings H-292 and H-293, include radiological analyses.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET Excavation
Description: Excavate waste cell contents in ET North and ET South, including contact soil and surrounding contaminated soil to depth of waste plus 2 feet overexcavation (use avg. trench depth + 2 feet for costing purposes). Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Load and haul ET excavated material to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work and backfill requirements.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Excavation	Yes	5	95

Total Marked-up Cost: $273,170

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 4 x 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		8,358	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET excavated material to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		190,865	$
Percentage	19.8	19.8	%
Dollar Amount		37,791	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,171	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	10	10	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate ET North. Average waste cell depth = 8 ft bgs.

Collect confirmation samples.

Backfill and compact with clean fill.

Estimate Documentation Report

Level C safety assumed due to VOC impacted soil.

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		4,799	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	12	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate ET South.

Excavation to be backfilled and compacted with Site consolidated excavated material.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decommission GW Monitoring Wells
Description: Decommission groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Residual Waste Management	Yes	80	20
Well Abandonment	Yes	20	80

Total Marked-up Cost: $624,402

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		594,669	$
Percentage	19	5	%
Dollar Amount		29,733	$

Comments:

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		41	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Estimate Documentation Report

Technology Name: **Well Abandonment (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Abandon Wells			
Required Parameters			
Technology/Group Name		DDC Wells	n/a
Number of Wells		3	EA
Well Depth		85	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		TP-1 through TP-5	n/a
Number of Wells		5	EA
Well Depth		81	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-2 Well	n/a
Number of Wells		1	EA
Well Depth		86	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-1 Wells	n/a
Number of Wells		6	EA
Well Depth		64	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a

Comments:

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Area Excavation
Description: Excavate LFU-1 Drainage Area. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean fill. Revegetate surface. Load and haul soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $609,893

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		491,228	$
Percentage	19.2	19.2	%
Dollar Amount		94,316	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		7,215	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	14	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	41	41	EA
Number of Composites Submitted to Lab	11	11	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 1 Drainage Area.
Collect default number of confirmation samples.
Backfill and compact with clean fill. Revegetate surface, a drainage swale will be constructed in this area after excavation..

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		3,839	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavated material to stockpiling areas. Assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Clearing and Grubbing
Description: Clear and grub areas to be excavated and/or capped.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80

Total Marked-up Cost: $54,151

Technologies:

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		2.42	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		424.830993652344	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 1 footprint.
Current satellite photo and photographs from recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume grubbed material will be kept on-site for re-use.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		3.88	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		681.134033203125	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 2/Eastern Trenches/Southern Trenches/Waste Burial Holes/HFSDA footprint.
Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume chipping and stockpiling is done on-site.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		1.01	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		177.30549621582	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear trees and vegetation at Landfill Unit 3. Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range. Assume grubbed material is stored and re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Materials Management
Description: Excavated material will be handled in accordance with a Materials Management Plan. Materials Management includes the cost of storage/stockpiling, sorting of waste streams, waste characterization, and staging for final disposal. Disposal is handled in a separate cost element. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Drum Staging	Yes	20	80
LOADER FOR STAGING AREA	Yes	0	100
WASTE CHARACTERIZATION SAMPLING	Yes	100	0
Professional Labor Management	Yes	80	20
Bulk Material Storage	Yes	20	80
Bulk Material Storage	Yes	20	80
SIFTING OF EXCAVATED MATERIAL	Yes	20	80

Total Marked-up Cost: $2,143,896

Technologies:

Estimate Documentation Report

Technology Name: **Drum Staging (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Waste		Solid	n/a
Solid: To be Staged		97	EA
Solid: Leaking/Damaged Requiring Overpacks		0	EA
Solid: To be Sampled		97	EA
Solid: Second Sample per Drum		No	n/a
Temporary Staging Area		1,128	SF
Drums to be Consolidated (Drums to Bulk)		97	EA
Drum Average Percentage Full		65	%
Safety Level		C	n/a
Handling			
Secondary Parameters			
Overpacks		85 Gal. Steel Salvage Drum	n/a
First Sample Analysis: Liquid		Waste Characterization, Liquid	n/a
First Sample Analysis: Solid / Sludge		Waste Characterization, Solids	n/a
Second Sample Analysis: Liquid		None	n/a
Second Sample Analysis: Solid / Sludge		None	n/a
Storage			
Secondary Parameters			
Liner/Temporary Staging Area	60 Mil Polymeric Liner, HDPE	60 Mil Polymeric Liner, HDPE	n/a
Drum Storage Systems: Quantity	0	0	EA
Drum Storage Systems: Type	Poly Spill Pallet, 4 Drum Cap	Poly Spill Pallet, 4 Drum Cap	n/a
Containment Berms: Quantity	0	0	EA
Containment Berms: Type	10" x 10" x 17", 750 Gallon	10" x 10" x 17", 750 Gallon	n/a

Comments: Drums for principal threat wastes/lab packs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LOADER FOR STAGING AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LOADER FOR STAGING AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled dirt needs to be moved around. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

Technology Name: **User Defined Estimate (# 2)**
User Name: **WASTE CHARACTERIZATION SAMPLING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WASTE CHARACTERIZATION SAMPLING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.06	n/a
Safety Level		D	n/a

Comments: Assume the included materials and analyses for waste characterization prior to final disposal of PTW and VOC "Hot Spot" TEV.
Assume 1 sample per 300 CY for costing purposes only. Actual sampling rate will be considered during remedial design.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		711,523	$
Percentage	18.7	18.7	%
Dollar Amount		133,055	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Bulk Material Storage (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Roll-Off/Bulk Containers/Tanks	n/a
Quantity of Material		387	CY
Safety Level		C	n/a
Secondary			
Secondary Parameters			
Size	30 CY Open Top Roll-Off Container	30 CY Open Top Roll-Off Container	n/a
Quantity	15	15	n/a

Comments: Bulk containers for PTW.

Estimate Documentation Report

Technology Name: **Bulk Material Storage (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Soil Bermed Storage Area	n/a
Quantity of Material		40,349	CY
Safety Level		D	n/a
Secondary			
Secondary Parameters			
Storage Area Quantity	1	1	EA
Storage Area Length	270	270	FT
Storage Area Width	270	270	FT
Berm Height	2	2	FT
Berm Top Width	2	2	FT
Slope: Feet Run / 1 Foot Rise	3	3	FT
Polymeric Liner Material	40 Mil Polymeric Liner, PVC	40 Mil Polymeric Liner, PVC	n\a
Polymeric Liner Quantity	1	1	EA
Soil Liner Material	None	None	n/a
Soil Liner Thickness	0	0	IN
Liner Protection Layer Material	Gravel	Gravel	n/a
Liner Protection Layer Thickness	12	12	IN

Comments: Stockpile TEV.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **SIFTING OF EXCAVATED MATERIAL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		SIFTING OF EXCAVATED MATERIAL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.90	n/a
Safety Level		C	n/a

Comments: Sorting of excavated material to segregate principal threat wastes. Assume the use of similar equipment used under the MEC Sifting assembly. Assume rate of sorting is approximately 200 CY/day.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET VOC "Hot Spot" Excavation
Description: Excavate ET VOC "Hot Spot." Apply 15% contingency for radiological work and backfill requirements.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Excavation	Yes	5	95

Total Marked-up Cost: $181,700

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,686	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		140,413	$
Percentage	19.9	19.9	%
Dollar Amount		27,942	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		713	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	58	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	6	6	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate the ET VOC "Hot Spot," East to a depth of 20 feet bgs. Backfill with clean fill.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		492	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	63	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate ET VOC "Hot Spot," West.

Excavation to be backfilled and compacted with Site consolidated soil/solid waste.
Level C PPE assumed because of potential VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Demolish LFU-3 N-S Drainage Channel
Description: The concrete lined drainage channel which partially overlays LFU-3 will be removed.
New N-S drainage channels will be re-constructed post-remediation.
This cost estimate assumes that a termporary drainage channel will not have to be created since the remedial action will take place in the dry season.

Approach: Ex Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
DEMOLISH LFU3 N-S DRAINAGE CHANNEL	Yes	100	0

Total Marked-up Cost: $10,264

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **DEMOLISH LFU3 N-S DRAINAGE CHANNEL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DEMOLISH LFU3 N-S DRAINAGE CHANNEL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.01	n/a
Safety Level		D	n/a

Comments: Demolish gunnite lined north-south drainage channel overlaying Landfill Unit 3. Assume thickness of gunnite lining = 2 inches, length of channel is 270 feet, top width of channel is 30 feet, base width of channel is 16 feet, depth of channel is 7 feet. Assume 270 feet of the channel will need to be demolished. The channel will be demolished to remove underlying waste. The channel will be restored in its original location, but without concrete lining. Demolished concrete will be re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added excavation volume, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $278,207

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		83	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	51	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	13	EA
Number of Composites Submitted to Lab	5	13	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T6 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		80	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	51	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	13	EA
Number of Composites Submitted to Lab	5	13	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T7 PTW excavation

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		210,234	$
Percentage	19.7	19.7	%
Dollar Amount		41,416	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		838	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		137	CY
Depth		7	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	40	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-35 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		55	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	45	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-36 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		38	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T1 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		40	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T2 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		41	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	60	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	7	EA
Number of Composites Submitted to Lab	5	7	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T3 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		57	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	56	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	10	EA
Number of Composites Submitted to Lab	5	10	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T4 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		69	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	53	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	11	EA
Number of Composites Submitted to Lab	5	11	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU1-T5 PTW excavation

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		2.4	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 PTW and Exploratory Trench Excavation
Description: Excavate trenches with known PTW based on previous exploratory trenches. Excavate new exploratory trenches and separate PTW for off-Site disposal. Backfill trenches with non-PTW material. 15% contingency for radiological worker safety, added volume of excavation, and additional backfill requirements.

Approach: In Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Remedial Investigation	Yes	100	0

Total Marked-up Cost: $300,782

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		132	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	15	EA
Number of Composites Submitted to Lab	5	15	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T3 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		132	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	57	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	15	EA
Number of Composites Submitted to Lab	5	15	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T4 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		228,564	$
Percentage	19.7	19.7	%
Dollar Amount		45,027	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		953	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavation material. Assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of targeted PTW excavations. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		11	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	74	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-2 TRL-12 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		48	CY
Depth		15	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	78	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-1 TRL-22 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		11	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	65	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: LFU-2 TRL-20 PTW excavation

Estimate Documentation Report

Technology Name: **Excavation (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		174	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	54	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	19	EA
Number of Composites Submitted to Lab	5	19	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T1 excavation. Collect soil/solid waste samples.

Estimate Documentation Report

Technology Name: **Excavation (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		174	CY
Depth		11	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	54	98	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	19	EA
Number of Composites Submitted to Lab	5	19	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: LFU2-T2 excavation. Collect samples.

Estimate Documentation Report

Technology Name: **Remedial Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		No	n/a
Other Investigations		Yes	n/a
Sampling and Analysis (S&A)		No	n/a
Add Groundwater Monitoring Wells		No	n/a
Add MEC Site Characterization && Removal Assessment		No	n/a
Site Distance (One-way)		73	MI
Site Complexity		Low	n/a
Safety Level		D	n/a
Other Invest.			
Required Parameters			
Magnetometer		0	AC
Electromagnetics		0	AC
Ground Penetrating Radar		2.2	AC
Slug Test: # Tests per Well		0	EA
Pump Test - Pneumatic: # Tests per Well		0	EA
Pump Test - Hydraulic: # Tests per Well		0	EA
Dye Tracer Test		0	EA

Comments: Geophysical survey to establish locations of potential waste cells. Assume ground-penetrating radar (GPR) used.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Excavated Material Consolidation
Description: Consolidate non-PTW excavated material from excavations in on-Site CAMUs. 10% contingency applied for consolidation of additional volume.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
CONSOLIDATE WASTE IN LFU-1 CAMU	Yes	5	95
CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU	Yes	5	95

Total Marked-up Cost: $87,682

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **CONSOLIDATE WASTE IN LFU-1 CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LFU-1 CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in LFU-1 CAMU.

Technology Name: **User Defined Estimate (# 2)**
User Name: **CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LFU-2/ET/WBH CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in LFU-2/ET/WBH CAMU.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 VOC "Hot Spot" Excavation
Description: Excavate LFU-2 VOC "Hot Spot." Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $47,289

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,210	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	52	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate the LFU-2 VOC "Hot Spot" to a depth of 20 feet bgs.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,693	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul LFU-2 VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		28,263	$
Percentage	20.1	20.1	%
Dollar Amount		5,681	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Excavation
Description: Excavate LFU-3 waste cells. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean import soil. Revegetate surface. Load and haul Landfill Unit 3 soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $893,073

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		695,026	$
Percentage	18.8	18.8	%
Dollar Amount		130,665	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		9,920	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	12	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	0	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	54	54	EA
Number of Composites Submitted to Lab	14	14	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 3 waste cells.
Collect default number of confirmation samples.
Import clean fill from on-Site source. Backfill and compact soil. Revegetate surface.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		13,889	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavated material to stockpiling areas. Assume stockpile area is immediately adjacent to LFU-3 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ST and HFSDA Excavation
Description: Excavate ST and HFSDA.
Confirmation samples will be collected after excavation.
Backfill and compact clean fill in ST and HFSDA excavation footprint.
Conduct land survey of excavation boundaries.
Assumes 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: June, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
LAND SURVEY OF EXCAVATION	Yes	10	90
Professional Labor Management	Yes	80	20
Excavation	Yes	100	0
Excavation	Yes	100	0
Load and Haul	Yes	20	80

Total Marked-up Cost: $206,155

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries excavation. 3 man survey crew - 2 x 1/2 days. Survey crew would have to come out during different phases of the excavation (assume 3 different times). Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		156,640	$
Percentage	19.8	19.8	%
Dollar Amount		31,015	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		461	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	6	6	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: The HFSDA will be excavated, and excavated material will be disposed off-Site. Confirmation samples will be collected. The excavation will be backfilled with clean fill and will be re-seeded.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,562	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	14	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	15	15	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Southern Trenches will be excavated. ST will be backfilled with clean fill and will be re-seeded.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		2,832	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ST and HFSDA excavated material to stockpiling areas. Assume stockpile area is to the north of ST, assume 500 feet transport distance.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Cap
Description: Install multiple-layer cap over LFU-1. Dispose non-hazardous waste generated by construction activities. Grade cap and surrounding area to promote drainage into storm drainage system. Survey boundaries of completed cap. 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Off-site Transportation and Waste Disposal	Yes	5	95
Capping	Yes	20	80
LAND SURVEY OF CAP	Yes	5	95
GRADE AROUND CAP TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $1,113,709

Technologies:

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		5	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-1 cap construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		RCRA C (Hazardous Waste) Cap	n/a
Acres		2	AC
Length		417	FT
Width		209	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	52	52	FT
Horizontal Projection of Top Slope	52	52	FT
RCRA C			
Secondary Parameters			
Surface Layer Type	Vegetated Layer	Vegetated Layer	n/a
Surface Layer Thickness	6	6	IN
Surface Layer Borrow Source	Off-site	Off-site	n/a
Protection Layer Thickness	24	24	IN
Protection Layer Borrow Source	Off-site	Off-site	n/a
Drainage Layer Type	Geocomposite	Geocomposite	n/a
Composite Barrier: Geomembrane Type	40 Mil HDPE	40 Mil HDPE	n/a
Composite Barrier: Compacted Clay Layer Type	Geosynthetic Clay Liner	Geosynthetic Clay Liner	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a
Gas Vent System		No	n/a

Comments: Install multiple-layer cap over Landfill Unit 1.
Total area of Landfill Unit 1 to be capped is assumed to cover 1.72 acres.
Additional cap area assumed based on cap extending 10.5 feet beyond Landfill Unit 1 perimeter due to 3.5 foot thick cap and 3:1 maximum slope.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF CAP**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF CAP	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foudation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetatitve cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 x 1/2 day. Licensed surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **GRADE AROUND CAP TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND CAP TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around cap to promote drainage.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		932,213	$
Percentage	18.3	18.3	%
Dollar Amount		170,595	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2/ET/WBH Cap
Description: Install multiple-layer cap over the footprint of LFU-2, ETs and WBHs. Assumes 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: July, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF CAP	Yes	5	95
Off-site Transportation and Waste Disposal	Yes	5	95
GRADE AROUND CAP TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Capping	Yes	20	80

Total Marked-up Cost: $1,861,724

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF CAP**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF CAP	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foudation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetatitve cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 x 1/2 day. Licensed surveyor report.

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		5	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during LFU-2/ET/WBH cap construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **GRADE AROUND CAP TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND CAP TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around cap to promote drainage.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		1,581,901	$
Percentage	17	17	%
Dollar Amount		268,923	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		RCRA C (Hazardous Waste) Cap	n/a
Acres		3.4	AC
Length		544	FT
Width		272	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	68	68	FT
Horizontal Projection of Top Slope	68	68	FT
RCRA C			
Secondary Parameters			
Surface Layer Type	Vegetated Layer	Vegetated Layer	n/a
Surface Layer Thickness	6	6	IN
Surface Layer Borrow Source	Off-site	Off-site	n/a
Protection Layer Thickness	24	24	IN
Protection Layer Borrow Source	Off-site	Off-site	n/a
Drainage Layer Type	Geocomposite	Geocomposite	n/a
Composite Barrier: Geomembrane Type	40 Mil HDPE	40 Mil HDPE	n/a
Composite Barrier: Compacted Clay Layer Type	Geosynthetic Clay Liner	Geosynthetic Clay Liner	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a
Gas Vent System		No	n/a

Comments: Install multiple-layer cap over the combined footprint of Landfill Unit 2, Eastern Trenches and Waste Burial Holes. Excludes north end of Eastern Trenches.
Additional cap area assumed based on cap extending 10.5 feet beyond waste perimeter due to 3.5 foot thick cap and 3:1 maximum slope.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Drainage Channels
Description: The concrete lined drainage channel which partially overlays LFU-3, will be reconstructed post-remediation.
The E-W LFU-3 drainage channel will also be reconstructed south of its original location.

Approach: Ex Situ
Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
E-W DITCH CONSTRUCTION	Yes	20	80
N-S DRAINAGE CHANNEL CONSTRUCTION	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $91,539

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **E-W DITCH CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		E-W DITCH CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Construction of new east-west drainage ditch at LFU-3, south of its original location. Assume 260 feet needed. This drainage ditch currently drains the Raptor Center and vicinity. It will discharge into the larger N-S concrete lined drainage ditch.

Technology Name: **User Defined Estimate (# 2)**
User Name: **N-S DRAINAGE CHANNEL CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		N-S DRAINAGE CHANNEL CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Reconstruction of north-south, drainage ditch. Assume 270 feet need to be restored. Dirt/grass lining.

Technology Name: **User Defined Estimate (# 3)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage channels. 2 x 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Off-Site Transportation and Disposal
Description: Transport and dispose of RCRA hazardous, mixed waste, Non-RCRA hazardous, LLRW, and non-hazardous waste material generated by Site remedial excavations. Hazardous wastes will be transported to Class I hazardous waste facility; solid LLRW and mixed waste to LLRW accepting facility; and non-hazardous materials at Class II non-hazardous landfill. Assume drummed PTW will be sent to the LLRW accepting facility, and biological waste will be incinerated.

Approach: Ex Situ
Start Date: September, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0

Total Marked-up Cost: $2,590,911

Technologies:

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		1,798	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	MI
Safety Level		D	n/a

Comments: Transport and dispose non-hazardous hazardous waste. Assume $19.50/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Non-leaking Drums	n/a
Quantity of Non-Leaking Drums		97	Drums
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dipose of drums containing PTW requiring stabilization. Assume default acceptance and treatment fee. Assume 594 mile transport distance.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Low-Level Radioactive Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		1,374	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose LLRW. Assume $1,080/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Mixed Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		87	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose mixed waste. Assume $2,814/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		970	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose RCRA hazardous waste. Assume $170/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		276	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose non-RCRA hazardous waste. Assume $85/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Storm Drainage
Description: Install storm drainage controls for the lined and capped CAMU. Drainage piping will be added to the perimeter of the CAMU which will discharge runoff into a detention basin. The detention basin will discharge to either the LFU-1 discharge point or the LFU-3 north-south concrete lined drainage channel depending on the basin's location.

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY	Yes	5	95
STORM WATER DETENTION BASIN	Yes	20	80
Excavation	Yes	5	95

Total Marked-up Cost: $474,347

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage control system. 1/2 day. Registered surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **STORM WATER DETENTION BASIN**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		STORM WATER DETENTION BASIN	n/a
WBS Type		HTRW	n/a
Selected WBS		331.09.07	n/a
Safety Level		D	n/a

Comments: Install detention basin to receive runoff from the LFU-1 and LFU-2/ET/WBH capped CAMUs.

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,346	CY
Depth		9	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	24	70	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate detention basin serving LFU-1 and LFU-2/ET/WBH CAMUs.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Swale
Description: Install a north-south trending unlined storm drainage channel in LFU-1 drainage area (assume 380 ft).

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LFU-1 DRAINAGE SWALE	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $18,841

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LFU-1 DRAINAGE SWALE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LFU-1 DRAINAGE SWALE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: North-south trending unlined storm drainage channel will be constructed in LFU-1 drainage area (assume 380 ft).

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage improvements. 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Install New GW Monitoring Wells
Description: Install, develop, and survey new groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
WELL DEVELOPMENT	Yes	40	60
Groundwater Monitoring Well	Yes	40	60
Residual Waste Management	Yes	80	20
LAND SURVEY	Yes	5	95
DDC WELL AND PIEZOMETER INSTALLATION	Yes	100	0

Total Marked-up Cost: $297,551

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		121,933	$
Percentage	19.9	5	%
Dollar Amount		6,097	$

Comments:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **WELL DEVELOPMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WELL DEVELOPMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.01	n/a
Safety Level		D	n/a

Comments: Rent equipment for well develoment for 1 week. One equipment operator and one supervising engineer/geologist.

Estimate Documentation Report

Technology Name: **Groundwater Monitoring Well (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Aquifers		Two	n/a
Include Guard Posts		No	n/a
Depth to Groundwater to Aquifer One		50	FT
Number of Wells to Aquifer One		9	EA
Depth to Groundwater to Aquifer Two		50	FT
Number of Wells to Aquifer Two		1	EA
Safety Level		D	n/a
Aquifer One			
Required Parameters			
Aquifer One: Average Well Depth		70	LF
Aquifer One: Formation Type		Unconsolidated	n/a
Aquifer One: Drilling Method		Hollow Stem	n/a
Aquifer One: Well Diameter		2 Inch	n/a
Aquifer One: Well Construction Material		PVC Schedule 80	n/a
Aquifer One: Split Spoon Sample Collection		Yes	n/a
Aquifer One: Average Number of Soil Samples per Well		0	EA
Aquifer One: Soil Analytical Template		None	n/a
Aquifer One: Safety Level		D	n/a
Aquifer Two			
Required Parameters			
Aquifer Two: Average Well Depth		105	LF
Aquifer Two: Formation Type		Unconsolidated	n/a
Aquifer Two: Drilling Method		Hollow Stem	n/a
Aquifer Two: Well Diameter		4 Inch	n/a
Aquifer Two: Well Construction Material		PVC Schedule 80	n/a
Aquifer Two: Split Spoon Sample Collection		Yes	n/a
Aquifer Two: Average Number of Soil Samples per Well		0	EA
Aquifer Two: Soil Analytical Template		None	n/a
Aquifer Two: Safety Level		D	n/a

Comments: Install new wells according to Table 5-3.

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		10	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey newly installed groundwater monitoring wells. Registered surveyor report. 0.5 day

Technology Name: **User Defined Estimate (# 4)**
User Name: **DDC WELL AND PIEZOMETER INSTALLATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DDC WELL AND PIEZOMETER INSTALLATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.90	n/a
Safety Level		D	n/a

Comments: Installation cost of 3 density-driven convection wells and 3 sets of nested piezometers (each nest containing 3 piezometers) as replacements for those decommissioned in the ET North.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building Reconstruction
Description: Replace buildings H-253, H-290, H-292, and H-293 with three new buildings during site restoration. The two Geriatrics buildings will be reconstructed. The LFU-3 storage building and Cobalt-60 Annex will replaced with one building equal in area to the two combined. The X buildings will not be replaced.

Approach: Ex Situ
Start Date: November, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0

Total Marked-up Cost: $423,616

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-292 (Geriatrics Building No. 1)

Technology Name: **User Defined Estimate (# 2)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-293 (Geriatrics Building No. 2)

Technology Name: **User Defined Estimate (# 3)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace buildings H-253 and H-290 with one builing equivalen in square footage.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 4)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Add 20% contingency to cost of building reconstruction.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Groundwater and Storm Water Monitoring
Description: Groundwater monitoring and storm water monitoring for lifetime of alternative until cleanup objectives are met. Sample collection, analysis, data validation, data import and monitoring reports.

Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
MONITORING	Yes	100	0

Total Marked-up Cost: $3,775,150

Technologies:

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		MONITORING	n/a
Groundwater		Yes	n/a
Surface Soil		No	n/a
Surface Water		Yes	n/a
Subsurface Soil		No	n/a
Sediment		No	n/a
Soil Gas		No	n/a
Air		No	n/a
Site Distance (One-way)		70	MI
Safety Level		D	n/a
Groundwater			
Required Parameters			
Average Sample Depth		50	FT
Samples per Event (First Year)		16	n/a
Samples per Event (Out Years)		16	n/a
Number of Events (First Year)		4	n/a
Number of Events (Out Years)		1	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	System Water - Low Level Radioactive	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Sampling Method	Existing Wells - Low Flow Pump	Existing Wells - Low Flow Pump	n/a
Number of Wells/Day	8	8	EA
Contain Purge Water	Yes	Yes	n/a
Surface Water			
Required Parameters			
Average Sample Depth		0	FT

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
Surface Water			
Required Parameters			
Samples per Event (First Year)		3	n/a
Samples per Event (Out Years)		3	n/a
Number of Events (First Year)		2	n/a
Number of Events (Out Years)		2	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	None	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Number of Samples/Day	8	8	EA
QA/QC			
Secondary Parameters			
Split Samples	1: 10	1: 10	EA
Field Duplicate Samples	1: 10	1: 10	EA
Rinse Blanks (per Round)	1	1	EA
Trip Blanks (per Day)	1	1	EA
Matrix Spikes/Matrix Spike Duplicates	1: 20	1: 20	EA
Data Management			
Secondary Parameters			
Monitoring Plan	Standard	Standard	n/a
Lab Data Review	Stage 2b	Stage 2b	n/a
Submit Data Electronically	Yes	Yes	n/a
Monitoring Reports	Abbreviated	Abbreviated	n/a

Comments: Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the capped areas. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, Semivolatile organic compounds (1,4-dioxane by single ion monitoring) Cam 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. Includes data validation, electronic data import, data management and monitoring reports.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M Drainage System
Description: Annual O&M of constructed storm water drainage control infrastructure.

Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	No	0	0

Total Marked-up Cost: $4,000

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	n/a
WBS Type		HTRW	n/a
Selected WBS		342.05.08	n/a
Safety Level		D	n/a

Comments: Assume annual maintenance costs of $4,000/year for lifetime of drainage system. Includes lined/capped CAMU detention basin, LFU-1 drainage swale, LFU-3 drainage channels. Present value cost for annual O&M of drainage channels. Assume $4,000/year in maintenance for lifetime of alternative. (Cost for this element expressed as annual cost only)

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M of Caps
Description: Operations and maintenance of multiple-layer capped areas. Assume top layer is vegetated.

Start Date: August, 2012
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Operations and Maintenance	Yes	40	60

Total Marked-up Cost: $1,018,340

Technologies:

Technology Name: **Operations and Maintenance**

Description	*Default*	*Value*	*UOM*
Labor			
Secondary Parameters			
Operations Labor: Type	Exclude from Estimate	Minimum	n/a
Professional Labor: Type	Exclude from Estimate	Minimum	n/a

Comments: Inspect, survey and repair CAMU cap for lifetime of alternative. Assumes some erosion and settlement, but no large scale failure.

Estimate Documentation Report

Technology Name: **Capping (# 1) - (O&M Parameters)**

Description	*Default*	*Value*	*UOM*
O&M Parameters			
Type of Cap		RCRA C (Hazardous Waste) Cap	n/a
Acres		5	AC
Surface Layer Type		Vegetated Layer	n/a

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Five-Year Reviews
Description: Five-Year Reviews for all technologies and controls implemented.

Start Date: March, 2015
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Five-Year Review	Yes	100	0

Total Marked-up Cost: $159,250

Technologies:

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Site Complexity		Low	n/a
Document Review		Yes	n/a
Interviews		Yes	n/a
Site Inspection		Yes	n/a
Report		Yes	n/a
Travel		No	n/a
Rebound Study		No	n/a
Start Date		March-2015	n/a
No. Reviews		6	EA
Document Review			
Required Parameters			
5-Year Review Check List		Yes	n/a
Record of Decision		Yes	n/a
Remedial Action Design & Construction		Yes	n/a
Close-Out Report		Yes	n/a
Operations & Maintenance Manuals & Reports		Yes	n/a
Consent Decree or Settlement Records		Yes	n/a
Groundwater Monitoring & Reports		Yes	n/a
Remedial Action Required		Yes	n/a
Previous 5-Year Review Reports		Yes	n/a
Interviews			
Required Parameters			
Current and Previous Staff Management		Yes	n/a
Community Groups		Yes	n/a
State Contacts		Yes	n/a
Local Government Contacts		Yes	n/a
Operations & Maintenance Contractors		Yes	n/a
PRPs		Yes	n/a
Remedial Design Consultant		Yes	n/a
Site Inspection			
Required Parameters			

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
Site Inspection			
Required Parameters			
General Site Inspection		Yes	n/a
Containment System Inspection		Yes	n/a
Monitoring Systems Inspection		Yes	n/a
Treatment Systems Inspection		Yes	n/a
Regulatory Compliance		Yes	n/a
Site Visit Documentation (Photos, Diagrams, etc.)		Yes	n/a
Report			
Required Parameters			
Introduction		Yes	n/a
Remedial Objectives		Yes	n/a
ARARs Review		Yes	n/a
Summary of Site Visit		Yes	n/a
Areas of Non Compliance		Yes	n/a
Technology Recommendations		Yes	n/a
Statement of Protectiveness		Yes	n/a
Next Review		Yes	n/a
Implementation Requirements		Yes	n/a

Comments: Inspect landfill areas for performance issues such as erosion or excessive settlement. Review and update all documents associated with compliance, performance, land use controls, and monitoring results. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews every five years for the lifetime of the alternative.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Periodic Storm Water Lift Station Repair
Description: Periodic costs associated with storm water lift station every ten years.

Start Date: August, 2020
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LIFT STATION PUMP REPLACEMENT	Yes	100	0

Total Marked-up Cost: $2,674

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LIFT STATION PUMP REPLACEMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LIFT STATION PUMP REPLACEMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		342.03.90	n/a
Safety Level		D	n/a

Comments: RACER assembly 33410101 Pump & Motor Cost = $892.37 x 2 lift stations. Assume cost incurred every ten years. Express cost as the one-time payment cost (in base year dollars). Present value over time cost is calculated outside of RACER.

ATTACHMENT F-7c

ALTERNATIVE SW-7 ASSEMBLY LEVEL REPORT

See file in Appendix F Folder titled 'Attachment_F-7c_SW-7_AssemblyLevelReport.xlsx'

ATTACHMENT F-8a

ALTERNATIVE SW-8 COST ASSUMPTIONS

ALTERNATIVE SW-8 COST ASSUMPTIONS

Attachment F-8a-1. Alternative SW-8 Description

Attachment F-8a-2. Planning and Oversight

Attachment F-8a-3. Biological Survey and Elderberry Shrub Cluster Relocation

Attachment F-8a-4. Decontamination Facilities

Attachment F-8a-5. Building Decommissioning and Demolition, Building Sampling and Analysis

Attachment F-8a-6. Building Decommissioning and Demolition, Building Demolition and Reconstruction

Attachment F-8a-7. Groundwater Monitoring Well Decommissioning

Attachment F-8a-8. Clearing and Grubbing

Attachment F-8a-9. Demolish LFU-3 Drainage Channel

Attachment F-8a-10. Excavation of Eastern Trenches

Attachment F-8a-11. Excavation of ET VOC “Hot Spot”

Attachment F-8a-12. Excavation of LFU-1

Attachment F-8a-13. Excavation of LFU-2

Attachment F-8a-14. Excavation of LFU-3

Attachment F-8a-15. Excavation of ST and HFSDA

Attachment F-8a-16. Excavation of Non-Impacted Area

Attachment F-8a-17. Materials Management

Attachment F-8a-18. Excavated Materials Consolidation

Attachment F-8a-19. Off-Site Transportation and Disposal

Attachment F-8a-20. Installation of Bottom Liner and Leachate Collection and Recovery System

Attachment F-8a-21. Install CAMU Multiple-layer Cap

Attachment F-8a-22. Install New Groundwater Monitoring Wells

Attachment F-8a-23. Storm Drainage Controls

Attachment F-8a-24. O&M: Institutional Controls

Attachment F-8a-25. O&M: Groundwater and Storm Water Monitoring

Attachment F-8a-26. O&M of Storm Water Drainage Infrastructure

Attachment F-8a-27. O&M of Multiple-layer Cap

Attachment F-8a-28. O&M of Leachate Collection and Recovery System

Attachment F-8a-29. Periodic Costs: Five Year Reviews

Attachment F-8a-30. Contingent Action: Import Fill and Additional Off-Site Disposal

Attachment F-8a-1. Alternative SW-8 Description - Cost Estimates, UC Davis LEHR/OCL

Alternative SW-8. VOC "Hot Spot" Removal, One On-Site Lined Corrective Action Management Unit with Multiple-Layer Cap, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring - Please see Section 5 of the FS - Volume 1 for a description of this alternative.

Alternative SW-8 Components Listed:

- Planning and oversight
- Biological Survey
- Elderberry Shrub Cluster Relocation
- Decontamination Facilities
- Building Decommissioning and Demolition
  - Building Sampling
  - Building Demolition and Reconstruction
- Groundwater Well Decommissioning
- Clearing and Grubbing
- Demolish/Backfill LFU-3 Drainage Channels
- ET Excavation - ET North and ET South
- ET VOC "Hot Spot," East and West Excavation
- LFU-1 Excavation
- LFU-2 Excavation - Including LFU-2 VOC "Hot Spot"
- LFU-3 Excavation - LFU-3 Waste Cells
- Excavate ST and HFSDA
- Non-Impacted Area Excavation
- Materials Management
- Excavated Materials Consolidation
- Off-Site Transportation and Disposal
- Multiple-Layer Cap With Liner and LCRS
- Install New Groundwater Wells
- Storm Drainage Controls
  - Storm Water Collection and Conveyance System
  - Installation of extended detention basin
  - Installation of vegetated swale along eastern edge of LFU-1
  - Redirect drainage ditch south along perimeter of LFU-3
  - Reconstruct north-south drainage channel
- Operations and Maintenance (O&M): Institutional Controls
- O&M: Groundwater and Storm Water Monitoring
- O&M of Storm Water Drainage Infrastructure
- O&M of Cap
- O&M of Leachate Collection and Recovery System
- Periodic Costs: Storm Water Lift Station Repair (See O&M of Storm Water Drainage Infrastructure)
- Periodic Costs: Five Year Reviews
- Contingent Action: Import of Clean Fill and Additional Off-Site Disposal

Planning and Oversight

Work planning, Health and Safety, Construction Quality Assurance/Quality Control Program, Construction Site Environmental Controls, Materials Management Plan (Table 5-1)

Costs for most planning and oversight are inclduded in RACER's "Professional Labor Management" cost sub-component and in professional labor cost assemblies.
These planning and oversight activities include:

Preparation and submittal of Contract-Required Deliverables
Preparation and submittal of project-specific planning documents (Work Plan, HASP, QAPP, materials management plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Sampling and Construction Quality Control Test Results
Health & Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Costs are estimated as a percentage of the calculated marked-up cost for a given remedial action component through "Professional Labor Management," or through professional labor assemblies included in the estimate for the remedial action cost component.

"Professional Labor Management" includes the costs of typical professional support activities associated with construction including preparation of site-specific construction activities, incidental permit acquisition, and contract-required deliverables. It also includes typical site-specific professional support activities associated with remedial action including evaluation of sampling and analysis data, comparison of results with project goals, coordination of field activities, and documentation and reporting of field activities. Each cost component has planning and oversight costs associated with it; where professional labor management is not specifically included as a cost sub-component, it is assumed that such cost estimates contain professional labor hours bundled with the cost for implementation of that cost component.

Attachment F-8a-3. Biological Survey and Elderberry Shrub Cluster Relocation - Cost Estimates, UC Davis LEHR/OCL

Biological Survey

Conduct a biological survey assessing selected plant, insect and animal species abundance, assess biotic diversity, and survey endangered/critical species' habitat.

Present findings in an biological survey report.

Elderberry Shrub Cluster Relocation

Elderberry shrub clusters located within areas potentially impacted by remediation will be relocated to the Russell Ranch Mitigation Area, as specified in the UC Davis Long Range Development Plan EIR Mitigation Measure 4.4-6(b).

Assume cost is $270,000 based on previous relocations.

Attachment F-8a-4. Decontamination Facilities - Cost Estimates, UC Davis LEHR/OCL

Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 72 weeks.

Equipment Decontamination Operation Length	72	weeks
Average crew size	10	
Shifts	1	per day

Prior to implementation of the alternatives, nine Site buildings will be demolished and hazardous waste will be disposed off-Site. Non-hazardous material will be recycled, re-used, or disposed in an on-Site CAMU. It is assumed the buildings are contaminated with asbestos, lead, and PCBs. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated. Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. Assume 1 sample per 300 ft² of building surfaces. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals.

Total Building Surface Area	43,287	ft²
Number of samples	141	(see backup work below)
Sampling rate	75	samples/day
Crew Size	3	2 radiation technicians + 1 Health and Safety Officer

Analytical:	TCLP (RCRA) (EPA 1311)	H-292 and H-293 will also include:
	Testing, TAL metals (6010/7000s)	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total
	Pesticides/PCBs (SW 3550B/SW 8081/8082)	Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic
	Asbestos in Bulk Solids/Soils (Identification by PLM)	Testing, rad analytical vegetation/sediment/soil, gross alpha, total gas flow proportional counting

Two (2) Geriatrics Buildings (H-292 and H-293)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building Surface Area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
100	53	5,285	10	5	walls	3,182	265	10	10
					roof	5,305	442	16	6
					floor	5,285	5,285	196	6
					other building materials (assume 5% of building structure)	---	300	11	9
					Total	13,772	6,292	233	31

Five (5) Vacant Animal Housing Buildings (H-231,-232,-234,-236,-237)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
25	20	500	10	5	walls	917	382	14	4
					roof	502	42	2	1
					floor	500	500	19	1
					other building materials (assume 5% of building structure)		46	2	4
					Total	1,919	970	36	10

Storage Building at West Side of Landfill No. 3 (H-253)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
40	30	1,200	10	5	walls	1,439	120	4	6
					roof	1,205	100	4	4
					floor	1,200	1,200	44	4
					other building materials (assume 5% of building structure)		71	3	5
					Total	3,844	1,491	55	19

Co-60 Annex (H-290)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
30	21	630	10	5	walls	1,039	87	3	4
					roof	632	53	2	1
					floor	630	630	23	1
					other building materials (assume 5% of building structure)		38	1	4
					Total	2,302	808	30	10
					Grand Total (all buildings)	43,287	19,734	731	141

Demolish and dispose of buildings that must be removed to implement remedial action. Assume buildings are contaminated with asbestos, lead, and PCBs. Non-hazardous demolition waste will be disposed of in the on-Site CAMUs; hazardous waste will be sent off-Site for disposal.

Building

1 Demolish, dispose of Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

2 Demolish, dispose of Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

3

Demolish, dispose of Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

4

Demolish, dispose of Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

5

Demolish, dispose of Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

6

Demolish, dispose of Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²
Type of Building	concrete	
Number of stories	1	
Percent Hazardous Material	5%	
Height	12	ft

Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

7

Demolish, dispose of Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

8

Demolish, dispose of storage building near northwest corner of Landfill No. 3 (H-253). Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	1,200	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	64	CY	
Volume Hazardous	3	CY	
Safety Level	Level D		

9 Demolish, dispose of Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	630	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	33	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

Note: A new building will be constructed to replace buildings H-253 and H-290. The replacement is assumed to be 1,830 square feet.

Total Volume of Non-Hazardous Building Demolition Waste to Dispose of Off-Site

0 CY

Total Volume of Hazardous Building Demolition Waste to Dispose of Off-Site

45 CY

Building Reconstruction Costs

Three warehouse buildings will be constructed. Two will be replacements for the Geriatrics buildings, H-292 and H-293, the third is to replace buildings, H-253 and H-290. Cost estimates are based on phone conversation with representative from Allied Steel (12/20/2010) and estimates from Rex Moore Electrical Contractors (12/22/2010) and J.W. McClenahan Company plumbing contractors (1/3/2011). Estimates include engineering, design, and construction. 20% contingency to be added to account for additional cost elements.

1,830 SF warehouse:

Building design and construction (with concrete foundation): $30,000	Dimensions: 35’ x 55’ x 10’	Distance to potable water main = 50 feet
Electrical: $16,031	1 restroom (toilet + sink)	Distance to sanitary sewer = 200 feet
Plumbing: $18,000	1 industrial sink	Distance to electrical distribution = 100 feet
Estimated Cost = $34.99/SF		

5,285 SF warehouse:

Building design and construction (with concrete foundation): $70,000	Dimensions: 53’ x 100’ x 10’	Distance to potable water main = 50 feet
Electrical: $27,214	1 restroom (toilet + sink)	Distance to gas = 100 feet
Plumbing: $47,250	2 industrial sinks	Distance to sanitary sewer = 300 feet
Estimated Cost = $27.34/SF	natural gas connection	

Decommission the following wells (Table 5-3):

Well	Total Boring Depth (ft bgs)	Well Diameter (inches)	Well Screen Type
DDC-1*	85.5	15	PVC
DDC-2*	80	15	PVC
DDC-3*	80	15	PVC
TP-1*	80	15	PVC
TP-2*	79	12.25	PVC
TP-3*	80.5	12.25	PVC
TP-4*	80.5	12.25	PVC
TP-5*	80	12.25	PVC
UCD1-008	56	2	PVC
UCD1-009	51.5	2	PVC
UCD1-012	65	4	PVC
UCD1-013	65	4	PVC
UCD1-050	69.5	4	Stainless Steel
UCD1-051	70	4	Stainless Steel
UCD1-065	72	2	PVC
UCD2-014	86	4	PVC

* If nested well, value is the borehole diameter.

Attachment F-8a-8. Clearing and Grubbing - Cost Estimates, UC Davis LEHR/OCL

Clear and Grub	Clear all trees and vegetation within footprint of excavation/cap. Used current satellite photo and photographs from recent field activities to estimate amount of vegetation to clear. Assumed all removed material will be stored on-Site for re-use.	
LFU-1	Disposal	on-site, chipped
	ACRES	2.4 AC
	FLORA DENSITY	light; 5 trees per acre
LFU-2/ET/WBH	Disposal	on-site, chipped
	ACRES	3.5 AC
	FLORA DENSITY	light; 15 trees per acre
LFU-3	Disposal	on-site, chipped
	ACRES	1.0 AC
	FLORA DENSITY	light; 10 trees per acre
ST/HFSDA	Add to LFU-2/ET/WBH clearing and grubbing cost element	
	Disposal	on-site, chipped
	ACRES	0.4 AC
	FLORA DENSITY	light; 15 trees per acre
Non-Impacted Area	Disposal	on-site, chipping
	ACRES	0.94 AC
	FLORA DENSITY	light; 5 trees per acre

Attachment F-8a-9. Demolish LFU-3 Drainage Channel - Cost Estimates, UC Davis LEHR/OCL

Description:

Demolish the LFU-3 N-S concrete lined drainage channel. The drainage area will be re-constructed in its original location post-remediation, but will have a vegetated lining instead of concrete.
The E-W drainage ditch will be destroyed/backfilled during remediation. It will be re-routed south of the LFU-3 area after remediation.

Major Assumptions:

Estimate the volume of concrete to be removed in demolition of Landfill Unit No. 3 N-S drainage channel:

Length (total)	270	ft
Length (portion to be demolished)	270	ft
Top Width of channel	30	ft
Bottom Width of channel	16	ft
Depth	7	ft
Thickness of concrete	0.17	ft
Length of side wall	9.90	ft
Volume of channel concrete to remove	1,626	ft^3
	60	CY

Estimated backfill for the current E-W channel in the footprint of the proposed cap:

Length	100	ft	
Top Width of channel	9	ft	
Bottom Width of channel	3	ft	
Depth	3	ft	
Volume to backfill:	2,700	ft^3	
	100	CY	
	140	**CY**	**bulk factor applied**

Attachment F-8a-10. Excavation of Eastern Trenches - Cost Estimates, UC Davis LEHR/OCL

Excavate ET North to 8 feet bgs and ET South to 20 feet bgs to accommodate the CAMU liner.
Dispose of excavated PTW off-Site. Backfill ET South with non-PTW material; backfill ET North with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET North

Volume		1,171 BCY
Avg. Depth		8 FT
Source of backfill	On-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Number of composites	default	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Off-Site Backfill Required		0 LCY
Safety Level		Level C

Excavate ET South (SW-8)

Volume		11,997 BCY
Avg. Depth		20 FT
Source of backfill	On-Site	
Number of confirmation samples	None, excavated area is part of lined and capped CAMU	
Off-Site Backfill Required		0 LCY

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety level C.

Load and Haul

Volume	18,435 LCY
One Way Haul Distance	500 FT

Land Survey of Excavation

Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-8a-11. Excavation of ET VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate ET VOC "Hot Spot," east and west to depth of 20 feet bgs.

Dispose of excavated hazardous material off-Site. For ET VOC "Hot Spot," east backfill and compact with clean fill. ET VOC "Hot Spot, west will become part of the lined and capped CAMU.

Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET VOC "Hot Spot," East

Volume		713 BCY
Avg. Depth		20 FT
Source of backfill	On-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		0 LCY
Safety Level		Level C

Excavate ET VOC "Hot Spot," West

Volume		492 BCY
Avg. Depth		20 FT
Source of backfill	On-Site	
Number of confirmation samples	None, excavated area part of lined and capped CAMU	
Percent to be used as backfill (on-Site)		100 %
Off-Site Backfill Required		0 LCY
Safety Level		Level C

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,686 LCY
One Way Haul Distance	500 FT

Land Survey of Excavation

Survey boundaries of ET VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-8a-12. Excavation of LFU-1 - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-1 to twenty feet bgs to accommodate CAMU liner and non-PTW excavated material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-1 (SW-8)

Volume		65,657	BCY
Avg. Depth		20	FT
Source of backfill	On-Site		
Number of confirmation samples	None, excavated area part of lined and capped CAMU		
Off-Site Backfill Required		0	LCY
Safety Level		Level D	

Load and Haul

Volume	91,920	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety level C.

Land Survey of Excavation

Survey boundaries of Landfill Unit No. 1 excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-8a-13. Excavation of LFU-2 - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-2 to twenty feet bgs to accommodate CAMU liner and non-PTW excavated material.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-2 (SW-8)

Excavation includes LFU-2 VOC "Hot Spot"

Volume		69,873 BCY
Avg. Depth		20 FT
Source of backfill	On-Site	
Number of confirmation samples	None, excavated area part of lined and capped CAMU	
Off-Site Backfill Required		0 LCY
Safety Level		Level D

Load and Haul

Load and haul Landfill Unit No. 2 soil and waste to stockpiling areas. Assume stockpile area is to the east of LFU2, assume 500 feet transport distance.

Excavated Volume	97,822 LCY
One Way Haul Distance	500 FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Land Survey of Excavation

Survey boundaries of Landfill Unit No. 2 excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency

radiological work	15 %

Attachment F-8a-14. Excavation of LFU-3 - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-3 Waste Cells to ten feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-3 Waste Cells:

Volume		9,920 BCY
Avg. Depth		10 FT
Source of backfill	On-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Number of composites	default	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		0 LCY
Safety Level		Level D

Load and Haul

Volume	13,889 LCY
One Way Haul Distance	500 FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Land Survey of Excavation

Survey boundaries of excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Excavate the ST and HFSDA. Backfill the excavations with clean fill.
Segregate and dispose of the PTW off-Site and dispose of non-PTW material in the on-Site lined and capped CAMU.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate ST

Volume		1,562	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	default, 1 per 625 ft² (25 ft x 25 ft grid)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		0	LCY
Safety Level		Level D	

Excavate HFSDA

Volume		461	BCY
Avg. Depth		6	FT
Source of backfill	On-Site		
Number of confirmation samples	default, 1 per 625 ft² (25 ft x 25 ft grid)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		0	LCY
Safety Level		Level D	

Load and Haul

Load and haul ST and HFSDA soil and waste to stockpiling areas. Assume stockpile area is to the north of ST, assume 500 feet transport distance.

Excavated volume	2,832	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety level C.

Land Survey of Excavation

Survey boundaries of ST and HFSDA excavation. 3 man survey crew - 2 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-8a-16. Excavation of Non-Impacted Area - Cost Estimates, UC Davis LEHR/OCL

Excavate Non-Impacted Area between LFU-1 and LFU-2 to accommodate CAMU liner and material to be consolidated in CAMU.
Use excavated soil as fill for backfill of on-Site excavations outside the CAMU footprint.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate Non-Impacted Area (overlying the Co-60 field, assume 6" thick concrete foundation in this area)

Volume		17,186 BCY
Avg. Depth		20 FT
Source of backfill	On-Site	
Number of confirmation samples	None, excavated area part of lined and capped CAMU	
Off-Site Backfill Required		0 LCY
Safety Level		Level D

Excavate Non-Impacted Area (not including Co-60 field between LFU-1 and LFU-2)

Volume		17,186 BCY
Avg. Depth		20 FT
Source of backfill	On-Site	
Number of confirmation samples	None, excavated area part of lined and capped CAMU	
Off-Site Backfill Required		0 LCY
Safety Level		Level D

Load and Haul

Load and haul excavated soil to stockpiling areas. Assume stockpile area is to the east of LFU-2, assume 500 feet transport distance.

Excavated Volume	48,121 LCY
One Way Haul Distance	500 FT

Land Survey of Excavation

Survey boundaries of Non-Impacted Area excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency Waste/impacted soil is encountered in this area — See F-8a-30

Materials management includes activities related to the management of excavated soil and solid waste (i.e., stockpiling, sifting/sorting, waste characterization, and staging prior to final disposal).

Bulk Material Storage

Accommodate total excavated volume (TEV) across all subareas to allow for sorting, waste characterization, and staging. Stockpile excavated material in bermed, covered storage area. Safety Level D.

TEV (from subareas excavated under this alternative)	274,704	LCY

Sifting of Excavated Material

Assume rate of sifting = 200 CY/day

Assume the use of similar equipment used under the MEC Sifting assembly. Material will be segregated into PTW, biological waste, and LTW waste streams. Safety Level C.

Soil/solid waste volume (PTW, biological waste, and LTW waste streams):	86,186	LCY
Trommel Screener	11	month
Grizzly Shaker Unit	11	month
Conveyors,	2	unit
Refuse Bottom Hopper	2	unit
5'x16' Double tray Vibrating Screening Unit	2	unit
Two full-time equipment operators, oilers (per screening operation)	7,199	hrs

Loader for Staging Area

One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled material needs to be moved. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

950, 3.0 CY, Wheel Loader (active)	2,200	hours
950, 3.0 CY, Wheel Loader (standby)	2,200	hours
Bobcat with Backhoe	22	month
All Terrain Forklift (Monthly Rental)	22	month

Waste Characterization

Assume the included materials and analyses for waste characterization prior to final disposal of excavated materials. (ET PTW and ET VOC Hotspot excavated material) 1 sample per 300 CY.

Material to be characterized:	PTW + VOC "Hot Spot" TEV + Non-Impacted Area TEV	
Total Volume	52,602	LCY
Sampling rate	1	sample/300 CY (or 1 sample per container)
Number of samples	176	
Analytical suite:		
Testing, TAL metals (6010/7000s)	257.73	$/sample
TCLP (RCRA) (EPA 1311), Soil Analysis	120.30	$/sample
Testing, soil & sediment analysis, BTEX/gasoline hydrocarbons mod EPA 8020 (PID/FIFD)	107.37	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	234.37	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	278.01	$/sample
Purgeable organics (624, 8260)	126.31	$/sample
Testing, semi-volatile organics, pkd. column (8250)	416.14	$/sample
Testing, paint filter liquids test (9095)	27.90	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, ignitibility (1010)	31.64	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, corrosivity (1110, NACE)	26.04	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, reactivity (cyanide/sulfide)	72.65	$/sample
Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic	133.34	$/sample
Testing, rad analytical, additional services, characterization of any unknown rad sample (low level)	194.36	$/sample

Drum Staging

Drums for PTW laboratory waste (lab pack) disposal. Includes characterization of wastes in drums. Assume number of drums = volume of PTW in LCY divided by four. Safety Level C.

Total PTW	1,116	LCY
Store PTW in container	41	containers (30 CY capacity)
Number of drums	279	
Percentage Full	65	%
Temporary Storage Area	3,256	ft²
Overpacks	85 gal. steel salvage drum	
Waste characterization	1 sample per drum, liquid waste characterization template	

Attachment F-8a-18. Excavated Materials Consolidation - Cost Estimates, UC Davis LEHR/OCL

CAMU	Volume to Consolidate [LCY]
Single Lined and Capped CAMU	205,996

Attachment F-8a-19. Off-Site Transportation and Disposal - Cost Estimates, UC Davis LEHR/OCL

	LLRW (LCY)	**Mixed Waste** (LCY)	**RCRA Hazardous** (LCY)	**Non-RCRA Hazardous** (LCY)	**Non-Hazardous** (LCY)	**Building Hazardous** (LCY)	**Building Non-Hazardous** (LCY)	**Drums/Lab Pack** (number of drums)
Distance to disposal facility	594 miles	594 miles	227 miles	227 miles	93 miles	227 miles	93 miles	594 miles
Volume*	1,484	123	1,554	276	17,989	45	0	
Volume for Incineration**	0	0	0	0	0	0	0	
Final Disposal Volumes	**1,484**	**123**	**1,554**	**276**	**17,989**	**45**	**0**	**279**

* See Table E-13 (Appendix E, FS - Volume 1).
** Biological waste only.

Assumptions for capacity of lined CAMU and volume of excavated material to be consolidated in CAMU. The CAMU is assumed to be comprised of two cells: one cell will be in the LFU-2/ET/WBH area, the other cell will include the LFU-1 area as well as the "non-impacted area" between ET and LFU-1 .

Liner Assumptions:

West (LFU-2/ET/WBH) Cell

	Liner Layers	**Area ft²**
1	geofabric	186,816
1	geomembrane	186,816
1	geosynthetic clay liner	186,816
2	geofabric	186,816
2	geomembrane	186,816
2	geosynthetic clay liner	186,816

Total Material (west cell)

geofabric	373,633
geomembrane	373,633
geosynthetic clay liner	373,633

East (LFU-1/Non-Impacted Area) Cell

	Liner Layers	**Area ft²**
1	geofabric	147,425
1	geomembrane	147,425
1	geosynthetic clay liner	147,425
2	geofabric	147,425
2	geomembrane	147,425
2	geosynthetic clay liner	147,425

Total Material (east cell)

geofabric	294,849
geomembrane	294,849
geosynthetic clay liner	294,849

Total Material (both cells)

geofabric	668,482 ft²
geomembrane	668,482 ft²
geosynthetic clay line	668,482 ft²

Leachate Collection and Recovery System (LCRS) Assumptions:

Length of Bottom Leachate Collection Pipe (west cell)

403 ft²

Length of Bottom Leachate Collection Pipe (east cell)

260 ft²

Total length of leachate collection pipe (both cells) 663 ft²

Sumps (per cell)	1 primary and 1 secondary per cell		
number of primary	1		
number of secondary	1		
number of locations	1		
number of sumps	2	Total number of sumps	4
number of pumps	2	Total number of pumps	4
Length of riser piping	33	Total length of riser piping	66

Length of piping to Leachate Collection Tank

Assume one 5,000 gallon leachate collection tank for both cells (east and west)

Located in northeast corner of WMU close to Co-60 Bldg

572 Length of pipe in feet

CAMU Capacity:

Approximate Volume of Lined WMU (west cell) to ground surface

1,952,658 **Estimated total vol (ft³)**

72,321 **Estimated total vol (CY)**

Approximate Volume of Lined WMU (east cell) to ground surface

1,475,301 **Estimated total vol (ft³)**

54,641 **Estimated total vol (CY)**

Total Capacity of Lined WMU (east and west cells)

126,961 Estimated total vol (BCY)

177,746 Estimated total vol (CY, multiply by bulk factor 1.4 to get amount of excavated material that can be placed in this volume, assumes excavated material is compacted)

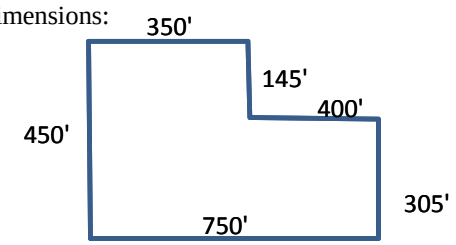
Attachment F-8a-20. Installation of Bottom Liner and Leachate Collection and Recovery System - Cost Estimates, UC Davis LEHR/OCL

Volume to be Consolidated in CAMU:	**Volume to Dispose On-Site (generated during excavation of land disposal units)**		
	ET North	1,617 LCY	See Exc ET
	ET South	16,703 LCY	
	ET VOC "Hot Spot," east	459 LCY	
	ET VOC "Hot Spot," west	288 LCY	
	HFSDA	646 LCY	
	LFU1	91,518 LCY	See Exc LFU1
	LFU2	95,994 LCY	See Exc LFU2
	LFU3	13,758 LCY	See Exc LFU3
	ST	2,163 LCY	See Exc ST
	WBH	0 LCY	---
	Building Demolition Waste	838 LCY	See Building D&D
	Non-Impacted Area	48,121 LCY	See Exc Suspected Clean Area
	Clean Fill Volumes Required On-Site		
	ET North excavated volume:	1,639 LCY	
	Eastern portion of ET VOC Hotspot:	998 LCY	
	LFU3 excavated volume:	13,889 LCY	
	ST and Potential HFSDA excavated volume:	2,832 LCY	
	Total (excavated volumes):	19,358 LCY	
	Volume required for cap foundation layer	581,136 ft^3	volume (approximate) needed = capped area * 2 feet (for foundation layer of cap)
		21,524 CY	convert to CY
	Total clean soil requirements on-site	**40,881 CY**	required by excavations and cap (Use clean soil from suspected clean area excavation)
	Excess suspected clean area material	7,239 CY	If > 0, the excess material is assumed to stay on-site to be used for other UC Davis needs; if<0 imported fill will be required
	Disposal units material for disposal	**223,985 CY**	**Sum ET, LFU1, LFU2, LFU3, ST, WBH, Building Demo**
	Excess waste (will not fit below surrounding grade, i.e. will be mounded under cap)	46,239 CY	Disposal units material for disposal - lined unit capacity (below grade)
		1,248,454 ft^3	convert to cubic feet
	Capped area	290,568 ft^2	
	Capped area to receive waste	217,926 ft^2	
	Excess waste cell height	6 ft	This size landfill could potentially handle all of the excavated material from the land disposal units when considering the mounding of the cap.
	Assuming waste cell height does not exceed 3.5 feet,	17,989 LCY	disposal of non-hazardous soil will be required
		205,996 LCY	excavated volume of material will be compacted in CAMU
		0 CY	**Imported fill required for this alternative**

Attachment F-8a-21. Install CAMU Multiple-layer Cap - Cost Estimates, UC Davis LEHR/OCL

Description: Construct multiple-layer cap over the lined CAMU.

Major Assumptions: Approximate dimensions:



Area:	6.7	acres	
Length:	see figure	feet	
Width:	see figure	feet	
Thickness:	3.5	feet	
Side slope:	3:1		(maximum)

Layers:

vegetative cover	6	inches
protection layer (clean fill/soil)	24	inches
Drainage layer (geocomposite)	-	inches
40 mil HDPE geomembrane	-	inches
Compacted Clay Layer (geocomposite clay lir	-	inches
foundation soil layer	12	inches
waste material		

Survey of lined and capped CAMU:

Survey crew would be needed at 3 points during the liner installation: prior to installation, after the geosynthetic clay liner and geomembrane are installed (ensure grade, marks leachate collection pipe and sumps, and mark welds in geomembrane), and after the second layer of geocomposite, geosynthetic clay, and geomembrane are added (marking the same as mentioned). 3 man survey crew - 3 six-hour-days.

Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foundation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetative cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 six-hour-days. Licensed surveyor report.
Total time required by surveying crew = 2.25 + 3 = 5.25 days

Attachment F-8a-22. Install New Groundwater Wells - Cost Estimates, UC Davis LEHR/OCL

Groundwater Well Installation - Eight HSU-1 groundwater monitoring wells and one HSU-2 groundwater monitoring well would be installed. The wells will have screen/sand pack intervals of seven feet or less to minimize their potential to act as vertical conduits for downward COC migration, and will be completed just below the bottom of the depth range of seasonal water table fluctuation. In addition, it is assumed that three density-driven convection (DDC) wells and three nested piezometers would be installed as replacements for those decommissioned in the ET North.

8 HSU-1 wells, 70 ft depth, 2" diameter, PVC Schedule 80
1 HSU-2 well, 105 ft depth, 4" diameter, PVC Schedule 80
3 DDC wells, 90 ft depth, 15" diameter borehole. Each DDC well assumed to include:
- Recirculating well: 90 ft depth, 4" diameter, PVC Schedule 80
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 30 ft depth
  - Intermediate: 52 ft depth
  - Deep: 76 ft depth
- Air Injection Tubing: 90 ft depth + 35 feet to blower, 1.25" diameter, PVC Schedule 80
- Vapor Return Line: 50 feet to discharge pipe, 2" diameter, PVC Schedule 80
- Acid Drip Line: 50 feet to acid storage, 0.75" diameter, PVC Schedule 80

3 Sets of Nested Piezometers, 80 ft depth, 15" diameter borehole. Each set of piezometers assumed to include:
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 35 ft depth
  - Intermediate: 53 ft depth
  - Deep: 80 ft depth

Dispose drill cuttings as non-hazardous waste
Survey and develop completed wells

Attachment F-8a-23. Storm Drainage Controls - Cost Estimates, UC Davis LEHR/OCL

LFU-1 Storm Drainage

North-south trending vegetated swale will be constructed to east of capped and lined CAMU.

Lining:	soil/vegetation	
Length	400	feet
Erosion Controls - Geotextile	326	yd^2
Erosion Controls - Rip-rap	24	CY

LFU-3 N-S Drainage Channel

North-south trending concrete-lined drainage channel will be reconstructed to match original dimensions.

Length	270	ft
Top Width	30	ft
Bottom Width	16	ft
Depth	7	ft
Length of north-south drainage channel to reconstruct	270	ft
Lining	soil/vegetation	
Erosion Controls - Geotextile	652	yd^2
Erosion Controls - Rip-rap	64	CY

LFU-3 E-W Drainage Ditch

Re-route the east-west vegetated drainage ditch to the south of LFU-3. Install new culvert to discharge into north-south, concrete-lined drainage channel.

Lining:	soil/vegetation	
Length	260	ft
Top Width	15	ft
Depth	3	ft
Erosion Controls - Geotextile	212	yd^2
Erosion Controls - Rip-rap	16	CY

LFU-1/LFU-2/ET/WBH Collection and Conveyance System, Lift Station and Extended Detention Basin

Size Basin

(d) Depth	4	ft	Area HDPE liner	8,944	ft^2
(l) Length	100	ft			
(w_b) Bottom Width	20	ft			
(w_t)Top Width	45	ft			
(V) Volume	13,000	ft^3			
	481	CY			
Length of piping:					
to detention basin	2,500	ft			
discharge from basin	630	ft			

Number of lift stations: 2

One north of LFU-2 to pump water to detention basin, one east of detention basin to pump toward discharge at LFU-1

Peak flow: 0.35 cfs

Survey :

Survey newly constructed drainage channels and detention basins. 2 half-days. Registered surveyor report.

Attachment F-8a-24 O&M: Institutional Controls - Cost Estimates, UC Davis LEHR/OCL

Perform initial survey to establish legal boundaries of Site.
Implement and maintain land use controls.
Document waste placement locations and prohibit site development or activities incompatible with designated land use.

		# meetings	# people	# days	airfare	mileage to meeting site
Planning Documents	LUC Assurance Plan	2	2	1	0	70
	LUC Implementation Plan	2	2	1	0	70
	Construction Permitting	1	1	1	0	70
	Geographic Information Systems/Overlay Maps	1	1	1	0	70
Implementation	Deed Notification	1	unit			
	Restrictive Covenants	1	unit			
	Access Control Signs	22	unit	Assume one sign every 150 feet around perimeter of land disposal units		
	Utility Notification Service	1	unit			
	GIS/Overlay maps	1	unit			
Monitoring and Enforcement						
	Duration of monitoring/enforcement	100	years or lifetime of project			
	Reports & Certifications	1	per year			
	Site Visits/Inspections	1	per year			
Survey:	5 days, licensed surveyors' report					

Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the land disposal units according to Table 5-3. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, semivolatile organic compounds (1,4-dioxane by single ion monitoring) CAM 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three designated storm water sampling locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. The groundwater and storm water monitoring period will continue throughout the lifetime of the alternative until Site cleanup goals are achieved.

Includes data validation, electronic data import, data management and monitoring reports.
14 wells to be included.

Attachment F-8a-26. O&M of Storm Water Drainage Infrastructure - Cost Estimates, UC Davis LEHR/OCL

Assume annual maintenance costs of $4,000/year for lifetime of drainage system.

Includes lined/capped CAMU detention basin and associated infrastructure, LFU-1 drainage swale, LFU-3 drainage channels

Periodic costs incurred every ten years for repair/replacement of lift station pumps (2 lift stations).

Attachment F-8a-27. O&M of Multiple-layer Cap - Cost Estimates, UC Davis LEHR/OCL

Inspect and repair caps for lifetime of cap. Assumes some erosion and settlement, but no large scale failure. RACER bases costs on total area of caps.

Total Capped Area: 6.67 acres

Attachment F-8a-28. O&M of Leachate Collection and Recovery System - Cost Estimates, UC Davis LEHR/OCL

Leachate will be collected in a 5,000 gallon storage tank on-Site. The tank will be emptied on an annual basis. It is assumed that 1,500 gallons of leachate would be generated per year.

Estimate the O&M costs for analyzing the leachate from the leachate collection system, collecting the leachate from tank, and discharging it at the UCD Wastewater Treatment Plant.

O&M costs also assumed to include maintenance and repair to leachate collection and recovery system (pumps, piping, etc.).

Attachment F-8a-29. Periodic Costs: Five Year Reviews - Cost Estimates, UC Davis LEHR/OCL

Review and update all documents associated with compliance, performance, land use controls. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews for period of 30 years

Document Review

Interviews	Current and Previous Staff Management
	Community Groups
	State Contacts
	Local Government Contacts
	Operations & Maintenance Contractors
	PRPs
	Remedial Design Consultant
Site Inspection	General Site Inspection
	Containment System Inspection
	Monitoring Systems Inspection
	Treatment Systems Inspection
	Regulatory Compliance
	Site Visit Documentation (Photos, Diagrams, etc.)
Report	

It is assumed that the soil excavated from the Non-Impacted area could be used as a source of on-Site fill for backfill of excavated areas outside the CAMU footprint. This contingency action considers what it would cost if instead, clean fill had to be imported if soil from the Non-Impacted area is found to be contaminated. The contingency cost also includes cost of off-Site disposal of the Non-Impact area material as Non-RCRA hazardous waste.

Disposal of Non-Impacted Area excavated material as Non-RCRA hazardous waste:

Volume:	48,121	LCY
Assumptions:		
Disposal fee = $85/CY (vendor quote)		
Distance to landfill = 227 miles		
Transportation Cost per cubic mile (Based on RACER transportation cost = $2.23/mile, distance to landfill, and 20 CY capacity of disposal truck) = $51/CY		
Truck liner = $2.61/truck (RACER)		
Loading cost = $2.85/CY (RACER)		
Total Estimated Transportation and Disposal Cost:	141	$/CY
Estimated Cost for Off-Site Transportation and Disposal:	$6,785,004	

Import of Clean Fill:

Volume Required	19,358	LCY
Estimated Unit Cost of Import Fill (including delivery, spreading and compaction) (RACER 10.3)	10.73	$/CY
Estimated Cost for off-Site fill:	$207,707	

Total Contingent Action Cost: $6,992,711

ATTACHMENT F-8b

ALTERNATIVE SW-8 ESTIMATE DOCUMENTATION REPORT

Estimate Documentation Report

System:

RACER Version: 10.3.0
Database Location: C:\Documents and Settings\gch\Application Data\AECOM\RACER 10.3\Racer.mdb

Folder:

Folder Name: Alternative SW-8

Project:

Project ID: FS_Cost
Project Name: Feasibility Study Cost Estimate
Project Category: Detailed Analysis of FS Alternatives

Location
State / Country: CALIFORNIA
City: SACRAMENTO

Location Modifier	Default	User
	1.203	1.203

Options
Database: Modified System
Cost Database Date: 2010
Report Option: Calendar

Description
Cost estimates in support of the CERCLA Feasibility Study for University of California, Davis areas of responsibility at the Laboratory for Energy-Related Health Research/Old Campus Landfill Site. Use Modified System Costs to add custom cost assemblies.

Estimate Documentation Report

Site Documentation:

Site ID: LEHR/OCL
Site Name: Alternative SW-8
Site Type: Land Disposal Units

Media/Waste Type

Primary: Soil
Secondary: N/A

Contaminant

Primary: Multi-Contaminant
Secondary: Radioactive (Low Level)

Phase Names

Pre-Study:
Study:
Design:
Removal/Interim Action:
Remedial Action:
Operations & Maintenance:
Long Term Monitoring:
Site Closeout:

Documentation

Description: Alternative SW-8. VOC "Hot Spot" Removal, One On-Site Lined Corrective Action Management Unit with Multiple-Layer Cap, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring.

See Section 5 of the FS for a description of this alternative.

Support Team: Weiss Staff
References: RACER 2010 System Costs Database

Estimate Documentation Report

Estimated Costs:

Phase Names	Direct Cost	Marked-up Cost
Biological Survey	$34,759	$86,304
Decontamination Facilities	$520,561	$1,157,352
Institutional Controls	$445,672	$1,039,283
Building D&D	$212,542	$314,966
Elderberry Mitigation	$270,000	$270,000
Clearing and Grubbing	$32,908	$60,339
Decommission GW Monitoring Wells	$445,743	$631,623
ET Excavation	$181,446	$301,634
ET VOC "Hot Spot" Excavation	$109,022	$174,189
Materials Management	$4,366,955	$7,157,613
Demolish LFU-3 N-S Drainage Channel	$6,850	$10,264
Excavated Material Consolidation	$413,765	$700,300
LFU-3 Excavation	$142,727	$230,423
LFU-1 Excavation	$561,903	$952,602
ST and HFSDA Excavation	$51,618	$78,337
LFU-3 Drainage Channels	$50,707	$91,539
Off-Site Transportation and Disposal	$3,122,294	$3,778,710
LFU-2 Excavation	$596,148	$1,010,770
Non-Impacted Area Excavation	$364,534	$568,546
Multiple-Layer Cap With Liner and LCRS	$4,263,280	$7,455,403
Install New GW Monitoring Wells	$199,829	$288,862
LFU-1 Drainage Swale	$10,442	$18,841
Storm Drainage	$299,205	$476,807
Building Reconstruction	$423,616	$423,616
Groundwater and Storm Water Monitoring	$2,568,088	$3,479,037
O&M Drainage System	$4,000	$4,000
O&M of Leachate Collection and Recovery System	$160,067	$216,226
O&M of Caps	$610,154	$1,190,181
Five-Year Reviews	$63,558	$159,250
Periodic Storm Water Lift Station Repair	$1,785	$2,674
Total Cost:	$20,534,178	$32,329,692

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Biological Survey
Description: Perform biological survey of Site prior to remedial action to assess population abundance and diversity of selected plant and animal species.

Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
RCRA Facility Investigation	Yes	100	0

Total Marked-up Cost: $86,304

Technologies:

Estimate Documentation Report

Technology Name: **RCRA Facility Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		No	n/a
Other Investigations		No	n/a
Site Distance		70	MI
Site Complexity		Low	n/a
Site Charact.			
Required Parameters			
Fieldwork Support		No	n/a
Evaluate Site Geology/Hydrogeology		No	n/a
Evaluate Site Soils/Surface Hydrology		No	n/a
Evaluate Site Meteorology		No	n/a
Evaluate Populations and Land Usage		No	n/a
Evaluate Site Ecology		Yes	n/a
Evaluate Nature and Extent of Contamination		No	n/a
Evaluate Contaminant Fate and Transport		No	n/a
Conduct Baseline Risk Assessment		No	n/a
Compose RFI Report		Yes	n/a

Comments: On-Site biological survey with particular emphasis on threatened and endangered species prior to commencement of any remedial activities.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Institutional Controls
Description: Implement and maintain Institutional/Land Use Controls to prohibit Site development or activities incompatible with designated land use.

Approach: In Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
INITIAL LAND SURVEY	Yes	5	95
ADMINISTRATIVE LAND USE CONTROLS	Yes	100	0

Total Marked-up Cost: $1,039,283

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **INITIAL LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		INITIAL LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew to establish legal boundaries defining the Site's boundaries. Licensed surveyor report. 3 man survey crew - 5 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Rename Model		ADMINISTRATIVE LAND USE CONTROLS	n/a
Planning Documents		Yes	n/a
Planning Documents: Start Date		2010	n/a
Implementation		Yes	n/a
Implementation: Start Date		2010	n/a
Monitoring & Enforcement		Yes	n/a
Monitoring & Enforcement: Start Date		2010	n/a
Modification/Termination		No	n/a
Type of Site		Former Government Site	n/a
Planning Documents			
Required Parameters			
LUC Assurance Plan (LUCAP)		Yes	n/a
LUC Assurance Plan (LUCAP): Plan Complexity		Medium	n/a
LUC Implementation Plan (LUCIP)		Yes	n/a
LUC Implementation Plan (LUCIP): Number		1	EA
LUC Implementation Plan (LUCIP): Plan Complexity		Medium	n/a
Long-term Stewardship (LTS) Plan		No	n/a
Memorandum of Agreements (MOA)		No	n/a
Installation (or City) Master Plan		No	n/a
Construction Permitting		Yes	n/a
Construction Permitting: Number		1	EA
Construction Permitting: Plan Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Plan Complexity		Low	n/a
Planning Meetings			
Required Parameters			
LUCAP: Number of Meetings		2	EA
LUCAP: Number of People		2	EA

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Planning Meetings			
Required Parameters			
LUCAP: Number of Days		1	EA
LUCAP: Airfare Cost		0	$
LUCAP: Mileage to Meeting Site		70	MI
LUCIP: Number of Meetings		2	EA
LUCIP: Number of People		2	EA
LUCIP: Number of Days		1	EA
LUCIP: Airfare Cost		0	$
LUCIP: Mileage to Meeting Site		70	MI
Construction Permitting: Number of Meetings		1	EA
Construction Permitting: Number of People		1	EA
Construction Permitting: Number of Days		1	EA
Construction Permitting: Airfare Cost		0	$
Construction Permitting: Mileage to Meeting Site		70	MI
GIS/Overlay Maps: Number of Meetings		1	EA
GIS/Overlay Maps: Number of People		1	EA
GIS/Overlay Maps: Number of Days		1	EA
GIS/Overlay Maps: Airfare Cost		0	$
GIS/Overlay Maps: Mileage to Meeting Site		70	MI
Implementation			
Required Parameters			
Modify Installation (or City) Master Plan		No	n/a
Deed Notification		Yes	n/a
Deed Notification: Number		1	EA
Deed Notification: Task Complexity		Low	n/a
Negotiating Easements		No	n/a
Restrictive Covenants		Yes	n/a
Restrictive Covenants: Number		1	EA
Restrictive Covenants: Task Complexity		Low	n/a
Equitable Servitudes		No	n/a
Access Control Signs		Yes	n/a

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Implementation			
Required Parameters			
Access Control Signs: Number		22	EA
Access Control Signs: Task Complexity		Low	n/a
Utility Notification Service		Yes	n/a
Access Control Signs: Number		1	EA
Access Control Signs: Task Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Task Complexity		Low	n/a
Develop Finding of Suitability to Transfer (FOST)		No	n/a
Monitoring & Enforcement			
Required Parameters			
Duration of Monitoring/Enforcement		31	Years
Notice Letters		No	n/a
Guard Service/Security		No	n/a
Reports & Certifications		Yes	n/a
Reports & Certifications: Frequency		Annually	n/a
Site Visits/Inspections		Yes	n/a
Site Visits/Inspections: Number		1	EA
Site Visits/Inspections: Safety Level		D	n/a
Site Visits/Inspections: Duration		1	Days
Site Visits/Inspections: Number of People		2	EA
Site Visits/Inspections: Frequency		Annually	n/a
Site Visits/Inspections: Airfare		0	$ Per Ticket
Site Visits/Inspections: Mileage		70	MI

Comments: Implement and maintain land use controls to prohibit Site development or activities incompatible with designated land use.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decontamination Facilities
Description: Provide decontamination facilities for equipment and personnel throughout duration of the remedial action.

Approach: Ex Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Decontamination Facilities	Yes	100	0

Total Marked-up Cost: $1,157,352

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		1,102,240	$
Percentage	17.9	5	%
Dollar Amount		55,112	$

Comments:

Estimate Documentation Report

Technology Name: **Decontamination Facilities (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
New Decontamination Facility Pad Construction		No	n/a
Equipment Rating		n/a	n/a
Equipment Decontamination Operations		Yes	n/a
Equipment Decontamination Operations: Duration		72	weeks
Personnel Decontamination Trailers		Yes	n/a
Personnel Decontamination Trailers: Average Crew Size		10	per shift
Personnel Decontamination Trailers: Duration		72	weeks
Safety Level		D	n/a
Work Shifts			
Secondary Parameters			
Equipment Decontamination	One Shift per Day		n/a
Personnel Decontamination	One Shift per Day		n/a

Comments: Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 72 weeks.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building D&D
Description: Prior to implementation of the alternative, nine Site buildings will be demolished and associated hazardous demolition material will be disposed off-Site. It is assumed that five percent of the demolition waste is contaminated with asbestos, lead, and PCBs. Non-hazardous building material will be recycled or disposed of in an on-Site CAMU. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated.
Apply 15% contingency for worker safety and additional waste volume.

Approach: Ex Situ
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Professional Labor Management	Yes	100	0
D&D, Sampling and Analysis	Yes	100	0

Total Marked-up Cost: $314,966

Technologies:

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		630	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		33.25	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		1.75	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		1,200	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		63.65	CY
Non-Hazardous Material: Distance (One-way)		1	MI
Non-Hazardous Material: Dump Charge		0	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		3.35	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose storage building (H-253) near northwest corner of Landfill No. 3. Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		191,492	$
Percentage	19.8	19.8	%
Dollar Amount		37,915	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Mobilizations		1	EA
Mobilization Distance		70	MI (One-way)
Soil/Sediment: # of Samples		0	EA
Soil/Sediment: Survey Area		0	SF
Water/Liquid: # of Samples		0	EA
Water/Liquid: Survey Area		0	SF
Building Surfaces: # of Samples		141	EA
Building Surfaces: Survey Area		43,287	SF
Sampling Rate		75	Per Day
Sampling Crew Size		2 Radiation Technicians, 1 Health and Safety Officer	n/a
Safety Level		D	n/a
Laboratory Analyses			
Required Parameters			
Soil: Alpha		No	n/a
Soil: Beta		No	n/a
Soil: Gamma		No	n/a
Soil: VOC"s		No	n/a
Soil: SVOC"s		No	n/a
Soil: Fuels		No	n/a
Soil: Pesticides		No	n/a
Soil: PCB"s		No	n/a
Soil: Metals		No	n/a
Soil: Acids/Caustics		No	n/a
Soil: Ordnance Residual		No	n/a
Water: Alpha		No	n/a
Water: Beta		No	n/a
Water: Gamma		No	n/a
Water: VOC"s		No	n/a
Water: SVOC"s		No	n/a

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Laboratory Analyses			
Required Parameters			
Water: Fuels		No	n/a
Water: Pesticides		No	n/a
Water: PCB"s		No	n/a
Water: Metals		No	n/a
Water: Acids/Caustics		No	n/a
Water: Ordnance Residual		No	n/a
Building: Alpha		No	n/a
Building: Beta		No	n/a
Building: Gamma		No	n/a
Building: VOC"s		No	n/a
Building: SVOC"s		No	n/a
Building: Fuels		No	n/a
Building: Pesticides		No	n/a
Building: PCB"s		Yes	n/a
Building: Metals		Yes	n/a
Building: Acids/Caustics		No	n/a
Building: Ordnance Residual		No	n/a
QA Blanks: Soil/Sediment		0	%
QA Blanks: Water/Liquid		0	%
QA Blanks: Building		15	%
Hand Scanning		1	Days
Adjustments/Productivity			
Secondary Parameters			
Turnaround Time		Standard (21 Days)	n/a
Quality Control		Level 1	n/a
Height Adjustment	15	15	%
Protective Clothing	23	23	%
RADCON	15	15	%
Respiratory Protection	38	38	%
Breaks	10	10	%

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Adjustments/Productivity			
Secondary Parameters			
Productivity Loss Multiplier	2.32	n/a	n/a

Comments: Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. One sample per ~300 ft2. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals. At two Geriartics Buildings H-292 and H-293, include radiological analyses.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Elderberry Mitigation
Description: Identify elderberry shrub clusters within work boundaries and relocate them within UC boundaries.

Approach: None
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ELDERBERRY SHRUB CLUSTER RELOCATION	No	0	0

Total Marked-up Cost: $270,000

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **ELDERBERRY SHRUB CLUSTER RELOCATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ELDERBERRY SHRUB CLUSTER RELOCATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.02	n/a
Safety Level		D	n/a

Comments: Cost for Elderberry mitigation based on previous transplanting operations at UC Davis.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decommission GW Monitoring Wells
Description: Decommission groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Residual Waste Management	Yes	80	20
Well Abandonment	Yes	20	80

Total Marked-up Cost: $631,623

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		601,546	$
Percentage	18.9	5	%
Dollar Amount		30,077	$

Comments:

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		42	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Estimate Documentation Report

Technology Name: **Well Abandonment (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Abandon Wells			
Required Parameters			
Technology/Group Name		DDC Wells	n/a
Number of Wells		3	EA
Well Depth		85	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		TP-1 through TP-5	n/a
Number of Wells		5	EA
Well Depth		81	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-1 Wells	n/a
Number of Wells		7	EA
Well Depth		64	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-2 Well	n/a
Number of Wells		1	EA
Well Depth		86	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a

Comments:

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Clearing and Grubbing
Description: Clear and grub areas to be excavated and/or capped.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80

Total Marked-up Cost: $60,339

Technologies:

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		2.42	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		424.830993652344	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 1 footprint.
Current satellite photo and photographs from recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume grubbed material will be kept on-site for re-use.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		4.78	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		839.129028320313	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 2/Eastern Trenches/Southern Trenches/Waste Burial Holes/HFSDA/Non-Impacted Area footprint.
Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume chipping and stockpiling is done on-site.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		1.01	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		177.30549621582	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear trees and vegetation at Landfill Unit 3. Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range. Assume grubbed material is stored and re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET Excavation
Description: Excavate waste cell contents in ET North, including contact soil and surrounding contaminated soil to depth of waste plus 2 feet overexcavation (use avg. trench depth + 2 feet for costing purposes). Excavated ET South to 20 feet to accomodate CAMU liner. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Load and haul ET excavated material to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work and backfill requirements.
Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate
Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Excavation	Yes	5	95

Total Marked-up Cost: $301,634

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 4 x 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		18,435	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET excavated material to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		180,065	$
Percentage	19.8	19.8	%
Dollar Amount		35,653	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,171	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	10	10	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate ET North. Average waste cell depth = 8 ft bgs.

Collect confirmation samples.

Backfill and compact with clean fill.

Estimate Documentation Report

Level C safety assumed due to VOC impacted soil.

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		11,997	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	26	0	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate ET South to accomodate lined and capped CAMU.

Excavation to be backfilled and compacted with Site consolidated soil/solid waste.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Materials Management
Description: Excavated material will be handled in accordance with a Materials Management Plan. Materials Management includes the cost of storage/stockpiling, sorting of waste streams, waste characterization, and staging for final disposal. Disposal is handled in a separate cost element. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Drum Staging	Yes	20	80
LOADER FOR STAGING AREA	Yes	0	100
WASTE CHARACTERIZATION SAMPLING	Yes	100	0
Professional Labor Management	Yes	80	20
Bulk Material Storage	Yes	20	80
Bulk Material Storage	Yes	20	80
SIFTING OF EXCAVATED MATERIAL	Yes	20	80

Total Marked-up Cost: $7,157,613

Technologies:

Estimate Documentation Report

Technology Name: **Drum Staging (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Waste		Solid	n/a
Solid: To be Staged		279	EA
Solid: Leaking/Damaged Requiring Overpacks		0	EA
Solid: To be Sampled		279	EA
Solid: Second Sample per Drum		No	n/a
Temporary Staging Area		3,256	SF
Drums to be Consolidated (Drums to Bulk)		279	EA
Drum Average Percentage Full		65	%
Safety Level		C	n/a
Handling			
Secondary Parameters			
Overpacks		85 Gal. Steel Salvage Drum	n/a
First Sample Analysis: Liquid		Waste Characterization, Liquid	n/a
First Sample Analysis: Solid / Sludge		Waste Characterization, Solids Includes Rads	n/a
Second Sample Analysis: Liquid		None	n/a
Second Sample Analysis: Solid / Sludge		None	n/a
Storage			
Secondary Parameters			
Liner/Temporary Staging Area	60 Mil Polymeric Liner, HDPE	60 Mil Polymeric Liner, HDPE	n/a
Drum Storage Systems: Quantity	0	0	EA
Drum Storage Systems: Type	Poly Spill Pallet, 4 Drum Cap	Poly Spill Pallet, 4 Drum Cap	n/a
Containment Berms: Quantity	0	0	EA
Containment Berms: Type	10" x 10" x 17", 750 Gallon	10" x 10" x 17", 750 Gallon	n/a

Comments: Drums for principal threat wastes/lab packs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LOADER FOR STAGING AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LOADER FOR STAGING AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled dirt needs to be moved around. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

Technology Name: **User Defined Estimate (# 2)**
User Name: **WASTE CHARACTERIZATION SAMPLING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WASTE CHARACTERIZATION SAMPLING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.06	n/a
Safety Level		D	n/a

Comments: Assume the included materials and analyses for waste characterization prior to final disposal of PTW and VOC "Hot Spot" TEV. Include the Non-Impacted Area TEV in this waste characterization.
Assume 1 sample per 300 CY for costing purposes only. Actual sampling rate will be considered during remedial design.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		2,741,695	$
Percentage	14.7	14.7	%
Dollar Amount		403,029	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Technology Name: **Bulk Material Storage (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Roll-Off/Bulk Containers/Tanks	n/a
Quantity of Material		1,116	CY
Safety Level		C	n/a
Secondary			
Secondary Parameters			
Size	30 CY Open Top Roll-Off Container	30 CY Open Top Roll-Off Container	n/a
Quantity	42	41.33333	n/a

Comments: Bulk containers for PTW.

Estimate Documentation Report

Technology Name: **Bulk Material Storage (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Soil Bermed Storage Area	n/a
Quantity of Material		276,398	CY
Safety Level		D	n/a
Secondary			
Secondary Parameters			
Storage Area Quantity	1	1	EA
Storage Area Length	513	513	FT
Storage Area Width	513	513	FT
Berm Height	2	2	FT
Berm Top Width	2	2	FT
Slope: Feet Run / 1 Foot Rise	3	3	FT
Polymeric Liner Material	40 Mil Polymeric Liner, PVC	40 Mil Polymeric Liner, PVC	n\a
Polymeric Liner Quantity	1	1	EA
Soil Liner Material	None	None	n/a
Soil Liner Thickness	0	0	IN
Liner Protection Layer Material	Gravel	Gravel	n/a
Liner Protection Layer Thickness	12	12	IN

Comments: Stockpile TEV.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **SIFTING OF EXCAVATED MATERIAL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		SIFTING OF EXCAVATED MATERIAL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.90	n/a
Safety Level		C	n/a

Comments: Sorting of excavated material to segregate principal threat wastes. Assume the use of similar equipment used under the MEC Sifting assembly. Assume rate of sorting is approximately 200 CY/day.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET VOC "Hot Spot" Excavation
Description: Excavate ET VOC "Hot Spot." Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Excavation	Yes	5	95

Total Marked-up Cost: $174,189

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,686	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		143,739	$
Percentage	19.9	19.9	%
Dollar Amount		28,604	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		713	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	58	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	6	6	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate the ET VOC "Hot Spot," East to a depth of 20 feet bgs. Backfill with clean fill.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		492	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	63	0	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate ET VOC "Hot Spot," West to accomodate lined and capped CAMU.

Excavation to be backfilled and compacted with Site consolidated soil/solid waste.
Level C PPE assumed because of potential VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Demolish LFU-3 N-S Drainage Channel
Description: The concrete lined drainage channel which partially overlays LFU-3 will be removed.
New N-S drainage channels will be re-constructed post-remediation.
This cost estimate assumes that a termporary drainage channel will not have to be created since the remedial action will take place in the dry season.

Approach: Ex Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
DEMOLISH LFU3 N-S DRAINAGE CHANNEL	Yes	100	0

Total Marked-up Cost: $10,264

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **DEMOLISH LFU3 N-S DRAINAGE CHANNEL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DEMOLISH LFU3 N-S DRAINAGE CHANNEL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.01	n/a
Safety Level		D	n/a

Comments: Demolish gunnite lined north-south drainage channel overlaying Landfill Unit 3. Assume thickness of gunnite lining = 2 inches, length of channel is 270 feet, top width of channel is 30 feet, base width of channel is 16 feet, depth of channel is 7 feet. Assume 270 feet of the channel will need to be demolished. The channel will be demolished to remove underlying waste. The channel will be restored in its original location, but without concrete lining. Demolished concrete will be re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Excavated Material Consolidation
Description: Consolidate non-PTW excavated material from excavations in on-Site CAMUs. 10% contingency applied for consolidation of additional volume.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
CONSOLIDATE WASTE IN LINED AND CAPPED CAMU	Yes	5	95

Total Marked-up Cost: $700,300

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **CONSOLIDATE WASTE IN LINED AND CAPPED CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LINED AND CAPPED CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in lined and capped CAMU.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Excavation
Description: Excavate LFU-3 waste cells. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean fill. Revegetate surface. Load and haul Landfill Unit 3 soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $230,423

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		135,981	$
Percentage	19.9	19.9	%
Dollar Amount		27,060	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		9,920	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	12	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	54	54	EA
Number of Composites Submitted to Lab	14	14	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 3 waste cells.
Collect default number of confirmation samples.
Import clean fill from on-Site source. Backfill and compact soil. Revegetate surface.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		13,889	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavated material to stockpiling areas. Assume stockpile area is immediately adjacent to LFU-3 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Excavation
Description: Excavate LFU-1 to 20 feet to accomodate the CAMU liner. Conduct land survey of on-Site backfill locations/volumes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: June, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0

Total Marked-up Cost: $952,602

Technologies:

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		512,786	$
Percentage	19.1	19.1	%
Dollar Amount		97,942	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		65,657	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	13	0	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate Landfill Unit 1 to accomodate lined and capped CAMU.

Excavation to be backfilled and compacted with Site consolidated soil/solid waste.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		91,920	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul Landfill Unit 1 excavated material to stockpiling areas. Assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ST and HFSDA Excavation
Description: Excavate ST and HFSDA.
Confirmation samples will be collected after excavation.
Backfill and compact clean fill in ST and HFSDA excavation footprint.
Conduct land survey of excavation boundaries.
Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: June, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
LAND SURVEY OF EXCAVATION	Yes	10	90
Professional Labor Management	Yes	80	20
Excavation	Yes	100	0
Excavation	Yes	100	0
Load and Haul	Yes	20	80

Total Marked-up Cost: $78,337

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 2 x 1/2 days. Survey crew would have to come out during different phases of the excavation (assume 3 different times). Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		49,823	$
Percentage	20.1	20.1	%
Dollar Amount		10,014	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		461	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	6	6	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: The HFSDA will be excavated, and excavated material will be disposed off-Site. Confirmation samples will be collected. The excavation will be backfilled with clean fill and will be re-seeded.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,562	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	14	0	%
Source of Additional Fill	Off Site	On Site	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	15	15	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Southern Trenches will be excavated. ST will be backfilled with clean fill and will be re-seeded.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		2,832	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavated material to stockpiling areas. Assume stockpile area is to the north of ST, assume 500 feet transport distance.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Drainage Channels
Description: The concrete lined drainage channel which partially overlays LFU-3, will be reconstructed post-remediation.
The E-W LFU-3 drainage channel will also be reconstructed south of its original location.

Approach: Ex Situ
Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
E-W DITCH CONSTRUCTION	Yes	20	80
N-S DRAINAGE CHANNEL CONSTRUCTION	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $91,539

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **E-W DITCH CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		E-W DITCH CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Construction of new east-west drainage ditch at LFU-3, south of its original location. Assume 260 feet needed. This drainage ditch currently drains the Raptor Center and vicinity. It will discharge into the larger N-S concrete lined drainage ditch.

Technology Name: **User Defined Estimate (# 2)**
User Name: **N-S DRAINAGE CHANNEL CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		N-S DRAINAGE CHANNEL CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Reconstruction of north-south, drainage ditch. Assume 270 feet need to be restored. Dirt/grass lining.

Technology Name: **User Defined Estimate (# 3)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage channels. 2 x 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Off-Site Transportation and Disposal
Description: Transport and dispose of RCRA hazardous, mixed waste, Non-RCRA hazardous, LLRW, and non-hazardous waste material generated by Site remedial excavations. Hazardous wastes will be transported to Class I hazardous waste facility; solid LLRW and mixed waste to LLRW accepting facility; and non-hazardous materials at Class II non-hazardous landfill. Assume drummed PTW will be sent to the LLRW accepting facility, and biological waste will be incinerated.

Approach: Ex Situ
Start Date: September, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0

Total Marked-up Cost: $3,778,710

Technologies:

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Non-leaking Drums	n/a
Quantity of Non-Leaking Drums		279	Drums
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dipose of drums containing PTW requiring stabilization. Assume default acceptance and treatment fee. Assume 594 mile transport distance.

Technology Name: **Off-site Transportation and Waste Disposal (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Low-Level Radioactive Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		1,484	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose LLRW. Assume $1,080/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Mixed Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		123	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose mixed waste. Assume $2,814/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		1,554	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose RCRA hazardous waste. Assume $170/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		276	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose non-RCRA hazardous waste. Assume $85/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		17,989	CY
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	MI
Safety Level		D	n/a

Comments: Transport and dispose non-hazardous waste. Assume $19.50/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 Excavation
Description: Excavate LFU-2 to depth of 20 feet to accomodate CAMU liner. Monitor air during remedial action. Survey excavation areas. Load and haul Landfill Unit 2 soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Include radiological work contingency (15%).

Approach: In Situ
Start Date: March, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $1,010,770

Technologies:

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		544,002	$
Percentage	19.1	19.1	%
Dollar Amount		103,904	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		69,873	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	13	0	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate Landfill Unit 2 to accomodate lined and capped CAMU.

Excavation to be backfilled and compacted with Site consolidated soil/solid waste.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		97,822	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul Landfill Unit 2 TEV to stockpiling areas.
Assume stockpile area is to the east of LFU-2, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Landfill Unit 2 excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Non-Impacted Area Excavation
Description: Excavate suspected clean area which encompasses the Co-60 field, and the area between the LFU-2 collocated areas and LFU-1. This area needs to be excavated in order to lay the bottom liner and leachate recovery system. Add 10% contingency for presence of waste in this area.

Approach: Ex Situ
Start Date: March, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Excavation	Yes	100	0
LAND SURVEY OF EXCAVATION	Yes	10	90
Excavation	Yes	100	0
Load and Haul	Yes	20	80

Total Marked-up Cost: $568,546

Technologies:

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		335,535	$
Percentage	19.5	19.5	%
Dollar Amount		65,429	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		17,186	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	0	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate the suspected clean area not covered by the Co-60 field. Assume soil is clean and can be used for backfill in the ET North, ET VOC "Hot Spot," East, LFU-3, ST and HFSDA. Confirmation samples not collected, excavated material to be characterized.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 1/2 days for surveying of Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		17,186	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	< 6 IN Concrete, Non-reinforced	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	0	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate the suspected clean area covered by the Co-60 field. Assume soil is clean and can be used for backfill in the ET North, ET VOC "Hot Spot," East, LFU-3, ST and HFSDA. Confirmation samples not collected, excavated material to be characterized.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		48,121	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul non-impacted area soil to stockpiling areas. Assume 500 feet transport distance.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Multiple-Layer Cap With Liner and LCRS
Description: Install multiple-layer cap over WBH, LFU-2, ET, and LFU-1 (non-drainage) areas. The area (with the exception of the WBH area) will also be excavated so a bottom liner and leachate collection system can be installed as well. Dispose non-hazardous waste generated by construction activities. Grade cap and surrounding area to promote drainage into storm drain system. Survey boundaries of completed cap. 15% contingency for radiological worker safety/increased landfill unit size or volume.

Approach: In Situ
Start Date: May, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Trenching/Piping	Yes	5	95
LEACHATE COLLECTION SYSTEM	Yes	20	80
GRADE AROUND CAMU TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Capping	Yes	20	80
INSTALLATION OF BOTTOM LINER AND LCS	Yes	20	80
LAND SURVEY OF CAMU	Yes	5	95
Off-site Transportation and Waste Disposal	Yes	5	95

Total Marked-up Cost: $7,455,403

Technologies:

Estimate Documentation Report

Technology Name: **Trenching/Piping (# 1)**

Description	*Default*	*Value*	*UOM*
Trenching			
Required Parameters			
Trench Length		572	FT
Trench Width		1	FT
Trench Depth		2	FT
% of Excavated Material Used as Backfill		100	%
Source of Additional Fill		Offsite	n/a
Dewatering Required		No	n/a
Floor Slab Sawing		0	HR
Soil Type		Silt/Silty-Clay Mixture	n/a
Existing Cover		Soil/Gravel	n/a
Replacement Cover		Soil/Gravel	n/a
Sidewall Protection		None	n/a
Horizontal Drilling Required		No	n/a
Safety Level		D	n/a
Piping			
Required Parameters			
Number of Pipes in Trench		1	EA
Pipe One: Pipe Material		PVC Sch 80	n/a
Pipe One: Pipe Diameter		2	IN

Comments: Estimate for piping required running from around surface of lined WMU to leachate collection tank at northeast corner of CAMU.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LEACHATE COLLECTION SYSTEM**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LEACHATE COLLECTION SYSTEM	n/a
WBS Type		HTRW	n/a
Selected WBS		331.09.06	n/a
Safety Level		D	n/a

Comments: 5,000 gallon storage tank for leachate collection. Include concrete slab that will include secondary containment.

Technology Name: **User Defined Estimate (# 2)**
User Name: **GRADE AROUND CAMU TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND CAMU TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around CAMU to promote drainage away from lined CAMU and towards drain inlets or discharge point at LFU-1.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		3,110,652	$
Percentage	13.9	13.9	%
Dollar Amount		432,381	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		RCRA C (Hazardous Waste) Cap	n/a
Acres		6.67	AC
Length		762	FT
Width		381	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	95	95	FT
Horizontal Projection of Top Slope	95	95	FT
RCRA C			
Secondary Parameters			
Surface Layer Type	Vegetated Layer	Vegetated Layer	n/a
Surface Layer Thickness	6	6	IN
Surface Layer Borrow Source	Off-site	Off-site	n/a
Protection Layer Thickness	24	24	IN
Protection Layer Borrow Source	Off-site	Off-site	n/a
Drainage Layer Type	Geocomposite	Geocomposite	n/a
Composite Barrier: Geomembrane Type	40 Mil HDPE	40 Mil HDPE	n/a
Composite Barrier: Compacted Clay Layer Type	Geosynthetic Clay Liner	Geosynthetic Clay Liner	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a
Gas Vent System		No	n/a

Comments: Install multiple-layer CAMU cover over LFU-2, ET, WBH, LFU-1, and non-impacted areas. Additional cap area assumed based on cap extending 10.5 feet beyond disposal unit perimeters for 3:1 maximum slope.
Total capped area = 6.67 acres

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 3)**
User Name: **INSTALLATION OF BOTTOM LINER AND LCS**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		INSTALLATION OF BOTTOM LINER AND LCS	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Installation of bottom liner for 1 large CAMU. From top, liner will consist of the following layers:
waste
permeable geofabric (leachate collection layer)
geomembrate 60 mil HDPE
geosynthetic clay liner
permeable geofabric (leachate detection layer)
geomembrane 60 mil HDPE
geosynthetic clay liner
native soil

The liner will include leachate collection piping, a primary and secondary leachate collection sump in the low points of the landfill, riser piping, sump pumps, and leachate collection piping and 5,000 leachate collection tank.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 4)**
User Name: **LAND SURVEY OF CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew would be needed at 3 points during the liner installation: prior to installation, after the geosynthetic clay liner and geomembrane are installed (ensure grade, marks leachate collection pipe and sumps, and mark welds in geomembrane), and after the second layer of geocomposite, geosynthetic clay, and geomembrane are added (marking the same as mentioned). 3 man survey crew - 3 x 3/4 day
Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foudation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetatitve cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 x 3/4 day. Licensed surveyor report.
Total time required by surveying crew = 2.25 + 3 = 5.25 days

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		20	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		10	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	2	2	EA

Comments: Transport, dispose waste generated during lined and capped CAMU construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Install New GW Monitoring Wells
Description: Install, develop, and survey new groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: August, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
WELL DEVELOPMENT	Yes	40	60
Groundwater Monitoring Well	Yes	40	60
Residual Waste Management	Yes	80	20
LAND SURVEY	Yes	5	95
DDC WELL AND PIEZOMETER INSTALLATION	Yes	100	0

Total Marked-up Cost: $288,862

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		113,659	$
Percentage	19.9	5	%
Dollar Amount		5,683	$

Comments:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **WELL DEVELOPMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WELL DEVELOPMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.01	n/a
Safety Level		D	n/a

Comments: Rent equipment for well develoment for 1 week. One equipment operator and one supervising engineer/geologist.

Estimate Documentation Report

Technology Name: **Groundwater Monitoring Well (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Aquifers		Two	n/a
Include Guard Posts		No	n/a
Depth to Groundwater to Aquifer One		50	FT
Number of Wells to Aquifer One		8	EA
Depth to Groundwater to Aquifer Two		50	FT
Number of Wells to Aquifer Two		1	EA
Safety Level		D	n/a
Aquifer One			
Required Parameters			
Aquifer One: Average Well Depth		70	LF
Aquifer One: Formation Type		Unconsolidated	n/a
Aquifer One: Drilling Method		Hollow Stem	n/a
Aquifer One: Well Diameter		2 Inch	n/a
Aquifer One: Well Construction Material		PVC Schedule 80	n/a
Aquifer One: Split Spoon Sample Collection		Yes	n/a
Aquifer One: Average Number of Soil Samples per Well		0	EA
Aquifer One: Soil Analytical Template		None	n/a
Aquifer One: Safety Level		D	n/a
Aquifer Two			
Required Parameters			
Aquifer Two: Average Well Depth		105	LF
Aquifer Two: Formation Type		Unconsolidated	n/a
Aquifer Two: Drilling Method		Hollow Stem	n/a
Aquifer Two: Well Diameter		4 Inch	n/a
Aquifer Two: Well Construction Material		PVC Schedule 80	n/a
Aquifer Two: Split Spoon Sample Collection		Yes	n/a
Aquifer Two: Average Number of Soil Samples per Well		0	EA
Aquifer Two: Soil Analytical Template		None	n/a
Aquifer Two: Safety Level		D	n/a

Comments: Install new wells according to Table 5-3.

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		9	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings, assume non-hazardous.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey newly installed groundwater monitoring wells. Registered surveyor report. 0.5 day

Technology Name: **User Defined Estimate (# 4)**
User Name: **DDC WELL AND PIEZOMETER INSTALLATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DDC WELL AND PIEZOMETER INSTALLATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.90	n/a
Safety Level		D	n/a

Comments: Installation cost of 3 density-driven convection wells and 3 sets of nested piezometers (each nest containing 3 piezometers) as replacements for those decommissioned in the ET North.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Swale
Description: Install a north-south trending unlined storm drainage channel in LFU-1 drainage area (assume 380 ft).

Approach: Ex Situ
Start Date: October, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LFU-1 DRAINAGE SWALE	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $18,841

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LFU-1 DRAINAGE SWALE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LFU-1 DRAINAGE SWALE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: North-south trending unlined storm drainage channel will be constructed in LFU-1 drainage area (assume 380 ft).

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage improvements. 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Storm Drainage
Description: Install storm drainage controls for the lined and capped CAMU. Drainage piping will be added to the perimeter of the CAMU which will discharge runoff into a detention basin. The detention basin will discharge to either the LFU-1 discharge point or the LFU-3 north-south concrete lined drainage channel depending on the basin's location.

Approach: Ex Situ
Start Date: October, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY	Yes	5	95
STORM WATER DETENTION BASIN	Yes	20	80
Excavation	Yes	5	95

Total Marked-up Cost: $476,807

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage control system. 1/2 day. Registered surveyor report.

Technology Name: **User Defined Estimate (# 2)**
User Name: **STORM WATER DETENTION BASIN**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		STORM WATER DETENTION BASIN	n/a
WBS Type		HTRW	n/a
Selected WBS		331.09.07	n/a
Safety Level		D	n/a

Comments: Install detention basin to receive runoff from the capped LFU-1 and LFU-2/ET/WBH CAMUs.

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,558	CY
Depth		9	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	69	%
Source of Additional Fill	Off Site	None	n/a
Backfill Hauling Distance (one way)	0	0	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	None	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	None	n/a

Comments: Excavate detention basin for the LFU-1 and LFU-2/ET/WBH CAMUs.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building Reconstruction
Description: Replace buildings H-253, H-290, H-292, and H-293 with three new buildings during site restoration. The two Geriatrics buildings will be reconstructed. The LFU-3 storage building and Cobalt-60 Annex will replaced with one building equal in area to the two combined. The X buildings will not be replaced.

Approach: Ex Situ
Start Date: December, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0

Total Marked-up Cost: $423,616

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-292 (Geriatrics Building No. 1)

Technology Name: **User Defined Estimate (# 2)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-293 (Geriatrics Building No. 2)

Technology Name: **User Defined Estimate (# 3)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace buildings H-253 and H-290 with one builing equivalen in square footage.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 4)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Add 20% contingency to cost of building reconstruction.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Groundwater and Storm Water Monitoring
Description: Groundwater monitoring and storm water monitoring for lifetime of alternative until cleanup objectives are met. Sample collection, analysis, data validation, data import and monitoring reports.

Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
MONITORING	Yes	100	0

Total Marked-up Cost: $3,479,037

Technologies:

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		MONITORING	n/a
Groundwater		Yes	n/a
Surface Soil		No	n/a
Surface Water		Yes	n/a
Subsurface Soil		No	n/a
Sediment		No	n/a
Soil Gas		No	n/a
Air		No	n/a
Site Distance (One-way)		70	MI
Safety Level		D	n/a
Groundwater			
Required Parameters			
Average Sample Depth		50	FT
Samples per Event (First Year)		14	n/a
Samples per Event (Out Years)		14	n/a
Number of Events (First Year)		4	n/a
Number of Events (Out Years)		1	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	System Water - Low Level Radioactive	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Sampling Method	Existing Wells - Low Flow Pump	Existing Wells - Low Flow Pump	n/a
Number of Wells/Day	8	8	EA
Contain Purge Water	Yes	Yes	n/a
Surface Water			
Required Parameters			
Average Sample Depth		0	FT

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
Surface Water			
Required Parameters			
Samples per Event (First Year)		3	n/a
Samples per Event (Out Years)		3	n/a
Number of Events (First Year)		2	n/a
Number of Events (Out Years)		2	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	None	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Number of Samples/Day	8	8	EA
QA/QC			
Secondary Parameters			
Split Samples	1: 10	1: 10	EA
Field Duplicate Samples	1: 10	1: 10	EA
Rinse Blanks (per Round)	1	1	EA
Trip Blanks (per Day)	1	1	EA
Matrix Spikes/Matrix Spike Duplicates	1: 20	1: 20	EA
Data Management			
Secondary Parameters			
Monitoring Plan	Standard	Standard	n/a
Lab Data Review	Stage 2b	Stage 2b	n/a
Submit Data Electronically	Yes	Yes	n/a
Monitoring Reports	Abbreviated	Abbreviated	n/a

Comments: Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the capped areas. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, Semivolatile organic compounds (1,4-dioxane by single ion monitoring) Cam 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. Includes data validation, electronic data import, data management and monitoring reports.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M Drainage System
Description: Annual O&M of constructed storm water drainage control infrastructure.

Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	No	0	0

Total Marked-up Cost: $4,000

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	n/a
WBS Type		HTRW	n/a
Selected WBS		342.05.08	n/a
Safety Level		D	n/a

Comments: Assume annual maintenance costs of $4,000/year for lifetime of drainage system. Includes lined/capped CAMU detention basin, LFU-1 drainage swale, LFU-3 drainage channels. Present value cost for annual O&M of drainage channels. Assume $4,000/year in maintenance for lifetime of alternative. (Cost for this element expressed as annual cost only)

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M of Leachate Collection and Recovery System
Description: Potential leachate will be collected in a 5,000 gallon storage tank on-site. The tank will be emptied on an annual basis. It is assumed for this cost estimate that the capped area of the landfill would produce 1,500 gallons of leachate per year. This cost estimate would also cover the costs to repair/maintain the LCRS system.

Start Date: November, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Operations and Maintenance	Yes	100	0

Total Marked-up Cost: $216,226

Technologies:

Estimate Documentation Report

Technology Name: **Operations and Maintenance**

Description	*Default*	*Value*	*UOM*
Labor			
Secondary Parameters			
Operations Labor: Type	Minimum	Minimum	n/a
Professional Labor: Type	Exclude from Estimate	Exclude from Estimate	n/a
Analytical			
Secondary Parameters			
Wastewater/Effluent: Sampling Frequency	Monthly	Annually	n/a
Wastewater/Effluent: Primary Analytical Template	System - Wastewater Effluent	System Water - Multi-Contaminant	n/a
Wastewater/Effluent: Secondary Analytical Template	None	None	n/a
Air Emissions: Sampling Frequency	Exclude from Estimate	Exclude from Estimate	n/a
Air Emissions: Primary Analytical Template	None	None	n/a
Air Emissions: Secondary Analytical Template	None	None	n/a
Solid Wastes: Sampling Frequency	Exclude from Estimate	Exclude from Estimate	n/a
Solid Wastes: Primary Analytical Template	None	None	n/a
Solid Wastes: Secondary Analytical Template	None	None	n/a
Heating Requirements			
Secondary Parameters			
Air Streams: Flow Rate	0	0	CFM
Air Streams: Temperature Difference	0	0	F
Air Streams: Months per Year	0	0	Month
Water Streams: Flow Rate	50	50	CFM
Water Streams: Temperature Difference	0	0	F
Water Streams: Months per Year	0	0	Month
Facility: Area	225	225	SF
Facility: Temperature Difference	0	0	F
Facility: Months per Year	0	0	Month

Comments: Estimate the O&M costs for analyzing the leachate from the leachate collection system, collecting the leachate from tank, and discharging it at the UCD Wastewater Treatment Plant. Assume cost covers maintenance costs associated with the LCRS.

Estimate Documentation Report

Technology Name: **Discharge to POTW (# 1) - (O&M Parameters)**

Description	*Default*	*Value*	*UOM*
O&M Parameters			
Transportation Mode		Tanker Truck	n/a
Sewer: Flow Rate		0	GPM
Sewer: Wastewater Disposal Fee (O&M only)		0	$/KGAL
Sewer: Hours of operation per day		0	hour(s)
Tanker Truck: Flow Rate		50	GPM
Tanker Truck: Distance to Connection		n/a	MI
Tanker Truck: Hours of operation per day		1	hour(s)
Flow Mechanism		None	n/a

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M of Caps
Description: Operations and maintenance of multiple-layer capped areas. Assume top layer is vegetated.

Start Date: August, 2012
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Operations and Maintenance	Yes	40	60

Total Marked-up Cost: $1,190,181

Technologies:

Technology Name: **Operations and Maintenance**

Description	*Default*	*Value*	*UOM*
Labor			
Secondary Parameters			
Operations Labor: Type	Exclude from Estimate	Minimum	n/a
Professional Labor: Type	Exclude from Estimate	Minimum	n/a

Comments: Inspect, survey and repair CAMU cap for lifetime of alternative. Assumes some erosion and settlement, but no large scale failure.

Estimate Documentation Report

Technology Name: **Capping (# 1) - (O&M Parameters)**

Description	*Default*	*Value*	*UOM*
O&M Parameters			
Type of Cap		RCRA C (Hazardous Waste) Cap	n/a
Acres		7	AC
Surface Layer Type		Vegetated Layer	n/a

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Five-Year Reviews
Description: Five-Year Reviews for all technologies and controls implemented.

Start Date: March, 2015
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Five-Year Review	Yes	100	0

Total Marked-up Cost: $159,250

Technologies:

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Site Complexity		Low	n/a
Document Review		Yes	n/a
Interviews		Yes	n/a
Site Inspection		Yes	n/a
Report		Yes	n/a
Travel		No	n/a
Rebound Study		No	n/a
Start Date		March-2015	n/a
No. Reviews		6	EA
Document Review			
Required Parameters			
5-Year Review Check List		Yes	n/a
Record of Decision		Yes	n/a
Remedial Action Design & Construction		Yes	n/a
Close-Out Report		Yes	n/a
Operations & Maintenance Manuals & Reports		Yes	n/a
Consent Decree or Settlement Records		Yes	n/a
Groundwater Monitoring & Reports		Yes	n/a
Remedial Action Required		Yes	n/a
Previous 5-Year Review Reports		Yes	n/a
Interviews			
Required Parameters			
Current and Previous Staff Management		Yes	n/a
Community Groups		Yes	n/a
State Contacts		Yes	n/a
Local Government Contacts		Yes	n/a
Operations & Maintenance Contractors		Yes	n/a
PRPs		Yes	n/a
Remedial Design Consultant		Yes	n/a
Site Inspection			
Required Parameters			

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
Site Inspection			
Required Parameters			
General Site Inspection		Yes	n/a
Containment System Inspection		Yes	n/a
Monitoring Systems Inspection		Yes	n/a
Treatment Systems Inspection		Yes	n/a
Regulatory Compliance		Yes	n/a
Site Visit Documentation (Photos, Diagrams, etc.)		Yes	n/a
Report			
Required Parameters			
Introduction		Yes	n/a
Remedial Objectives		Yes	n/a
ARARs Review		Yes	n/a
Summary of Site Visit		Yes	n/a
Areas of Non Compliance		Yes	n/a
Technology Recommendations		Yes	n/a
Statement of Protectiveness		Yes	n/a
Next Review		Yes	n/a
Implementation Requirements		Yes	n/a

Comments: Inspect landfill areas for performance issues such as erosion or excessive settlement. Review and update all documents associated with compliance, performance, land use controls, and monitoring results. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews every five years for the lifetime of the alternative.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Periodic Storm Water Lift Station Repair
Description: Periodic costs associated with storm water lift station every ten years.

Start Date: August, 2020
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LIFT STATION PUMP REPLACEMENT	Yes	100	0

Total Marked-up Cost: $2,674

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LIFT STATION PUMP REPLACEMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LIFT STATION PUMP REPLACEMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		342.03.90	n/a
Safety Level		D	n/a

Comments: RACER assembly 33410101 Pump & Motor Cost = $892.37 x 2 lift stations. Assume cost incurred every ten years. Express cost as the one-time payment cost (in base year dollars). Present value over time cost is calculated outside of RACER.

ATTACHMENT F-8c

ALTERNATIVE SW-8 ASSEMBLY LEVEL REPORT

See file in Appendix F Folder titled 'Attachment_F-8c_SW-8_AssemblyLevelReport.xlsx'

ATTACHMENT F-9a

ALTERNATIVE SW-9 COST ASSUMPTIONS

ALTERNATIVE SW-9 COST ASSUMPTIONS

Attachment F-9a-1. Alternative SW-9 Description

Attachment F-9a-2. Planning and Oversight

Attachment F-9a-3. Biological Survey and Elderberry Shrub Cluster Relocation

Attachment F-9a-4. Decontamination Facilities

Attachment F-9a-5. Building Decommissioning and Demolition, Building Sampling and Analysis

Attachment F-9a-6. Building Decommissioning and Demolition, Building Demolition and Reconstruction

Attachment F-9a-7. Groundwater Monitoring Well Decommissioning

Attachment F-9a-8. Clearing and Grubbing

Attachment F-9a-9. Demolish LFU-3 Drainage Channel

Attachment F-9a-10. Excavation of Eastern Trenches

Attachment F-9a-11. Excavation of ET VOC “Hot Spot”

Attachment F-9a-12. Excavation of LFU-1

Attachment F-9a-13. Excavation of LFU-2

Attachment F-9a-14. Excavation of LFU-2 VOC “Hot Spot”

Attachment F-9a-15. Excavation of LFU-3

Attachment F-9a-16. Excavation of ST and HFSDA

Attachment F-9a-17. Materials Management

Attachment F-9a-18. Excavated Materials Consolidation

Attachment F-9a-19. Off-Site Transportation and Disposal

Attachment F-9a-20. Install Waste Burial Holes Multiple-layer Cap

Attachment F-9a-21. Install New Groundwater Monitoring Wells

Attachment F-9a-22. Storm Drainage Controls

Attachment F-9a-23. O&M: Institutional Controls

Attachment F-9a-24. O&M: Groundwater and Storm Water Monitoring

Attachment F-9a-25. O&M of Storm Water Drainage Infrastructure

Attachment F-9a-26. O&M of Multiple-layer Caps

Attachment F-9a-27. Periodic Costs: Five Year Reviews

Attachment F-9a-1. Alternative SW-9 Description - Cost Estimates, UC Davis LEHR/OCL

Alternative SW-9 – Excavate and Dispose of Waste Off-Site, Waste Burial Holes Corrective Action Management Unit with Multiple-Layer Cap, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring - Please see Section 5 of the FS - Volume 1 for a description of this alternative.

Alternative SW-9 Components Listed:

- Planning and oversight
- Biological Survey
- Elderberry Shrub Cluster Relocation
- Decontamination Facilities
- Building Decommissioning and Demolition
  - Building Sampling
  - Building Demolition and Reconstruction
- Groundwater Well Decommissioning
- Clearing and Grubbing
- Demolish/Backfill LFU-3 Drainage Channels
- ET Excavation - ET North and ET South
- ET VOC "Hot Spot," East and West Excavation
- LFU-1 Excavation - LFU-1 Drainage Area and LFU-1 Non-Drainage Area
- LFU-2 Excavation - LFU-2 Waste Cells
- LFU-2 Excavation - LFU-2 Waste Cells
- LFU-3 Excavation - LFU-3 Waste Cells
- Excavate ST and HFSDA
- Materials Management
- Excavated Materials Consolidation
- Off-Site Transportation and Disposal
- Install WBH Multiple-Layer Cap
- Install New Groundwater Wells
- Storm Drainage Controls
  - Installation of vegetated swale along eastern edge of LFU-1
  - Redirect drainage ditch south along perimeter of LFU-3
  - Reconstruct LFU-3 north-south drainage channel
- Operations and Maintenance (O&M): Institutional Controls
- O&M: Groundwater and Storm Water Monitoring
- O&M of Storm Water Drainage Infrastructure
- O&M of Cap
- Periodic Cost: Five Year Reviews

Planning and Oversight

Work planning, Health and Safety, Construction Quality Assurance/Quality Control Program, Construction Site Environmental Controls, Materials Management Plan (Table 5-1)

Costs for most planning and oversight are inclduded in RACER's "Professional Labor Management" cost sub-component and in professional labor cost assemblies.
These planning and oversight activities include:

Preparation and submittal of Contract-Required Deliverables
Preparation and submittal of project-specific planning documents (Work Plan, HASP, QAPP, materials management plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Sampling and Construction Quality Control Test Results
Health & Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Costs are estimated as a percentage of the calculated marked-up cost for a given remedial action component through "Professional Labor Management," or through professional labor assemblies included in the estimate for the remedial action cost component.

"Professional Labor Management" includes the costs of typical professional support activities associated with construction including preparation of site-specific construction activities, incidental permit acquisition, and contract-required deliverables. It also includes typical site-specific professional support activities associated with remedial action including evaluation of sampling and analysis data, comparison of results with project goals, coordination of field activities, and documentation and reporting of field activities. Each cost component has planning and oversight costs associated with it; where professional labor management is not specifically included as a cost sub-component, it is assumed that such cost estimates contain professional labor hours bundled with the cost for implementation of that cost component.

Attachment F-9a-3. Biological Survey and Elderberry Shrub Cluster Relocation - Cost Estimates, UC Davis LEHR/OCL

Biological Survey

Conduct a biological survey assessing selected plant, insect and animal species abundance, assess biotic diversity, and survey endangered/critical species' habitat.

Present findings in an biological survey report.

Elderberry Shrub Cluster Relocation

Elderberry shrub clusters located within areas potentially impacted by remediation will be relocated to the Russell Ranch Mitigation Area, as specified in the UC Davis Long Range Development Plan EIR Mitigation Measure 4.4-6(b).

Assume cost is $270,000 based on previous relocations.

Attachment F-9a-4. Decontamination Facilities - Cost Estimates, UC Davis LEHR/OCL

Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 72 weeks.

Equipment Decontamination Operation Length	72	weeks
Average crew size	10	
Shifts	1	per day

Prior to implementation of the alternatives, nine Site buildings will be demolished and disposed of off-Site. It is assumed the buildings are contaminated with asbestos, lead, and PCBs. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated.
Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. Assume 1 sample per 300 ft² of building surfaces. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals.

Total Building Surface Area	43,287 ft²	
Number of samples	141	(see backup work below)
Sampling rate	75	samples/day
Crew Size	3	2 radiation technicians + 1 Health and Safety Officer

Analytical:	TCLP (RCRA) (EPA 1311)	H-292 and H-293 will also include:
	Testing, TAL metals (6010/7000s)	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total
	Pesticides/PCBs (SW 3550B/SW 8081/8082)	Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic
	Asbestos in Bulk Solids/Soils (Identification by PLM)	Testing, rad analytical vegetation/sediment/soil, gross alpha, total gas flow proportional counting

Two (2) Geriatrics Buildings (H-292 and H-293)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building Surface Area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	3,182	265	10	10
100	53	5,285	10	5	roof	5,305	442	16	6
					floor	5,285	5,285	196	6
					other building materials (assume 5% of building structure)	---	300	11	9
					Total	13,772	6,292	233	31

Five (5) Vacant Animal Housing Buildings (H-231,-232,-234,-236,-237)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	917	382	14	4
25	20	500	10	5	roof	502	42	2	1
					floor	500	500	19	1
					other building materials (assume 5% of building structure)		46	2	4
					Total	1,919	970	36	10

Storage Building at West Side of Landfill No. 3 (H-253)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	1,439	120	4	6
40	30	1,200	10	5	roof	1,205	100	4	4
					floor	1,200	1,200	44	4
					other building materials (assume 5% of building structure)		71	3	5
					Total	3,844	1,491	55	19

Co-60 Annex (H-290)

Length (ft)	Width (ft)	Area (ft²)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft²)	Volume of component (ft³)	volume of component (CY)	# samples
					walls	1,039	87	3	4
30	21	630	10	5	roof	632	53	2	1
					floor	630	630	23	1
					other building materials (assume 5% of building structure)		38	1	4
					Total	2,302	808	30	10
					Grand Total (all buildings)	43,287	19,734	731	141

Demolish and dispose of buildings that must be removed to implement remedial action. Assume buildings are contaminated with asbestos, lead, and PCBs. Demolition waste will be sent off-Site for disposal.

Building

1 Demolish, dispose of Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

2 Demolish, dispose of Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	5,285	ft²	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

3

Demolish, dispose of Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

4

Demolish, dispose of Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

5

Demolish, dispose of Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

6

Demolish, dispose of Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²
Type of Building	concrete	
Number of stories	1	
Percent Hazardous Material	5%	
Height	12	ft

Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

7

Demolish, dispose of Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	500	ft²	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

8

Demolish, dispose of storage building near northwest corner of Landfill No. 3 (H-253). Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	1,200	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	64	CY	
Volume Hazardous	3	CY	
Safety Level	Level D		

9 Demolish, dispose of Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed of at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Building Area	630	ft²	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	33	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

Note: A new building will be constructed to replace buildings H-253 and H-290. The replacement is assumed to be 1,830 square feet.

Total Volume of Non-Hazardous Building Demolition Waste to Dispose of Off-Site
838 CY

Total Volume of Hazardous Building Demolition Waste to Dispose of Off-Site
45 CY

Building Reconstruction Costs

Three warehouse buildings will be constructed. Two will be replacements for the Geriatrics buildings, H-292 and H-293, the third is to replace buildings, H-253 and H-290. Cost estimates are based on phone conversation with representative from Allied Steel (12/20/2010) and estimates from Rex Moore Electrical Contractors (12/22/2010) and J.W. McClenahan Company plumbing contractors (1/3/2011). Estimates include engineering, design, and construction. 20% contingency to be added to account for additional cost elements.

1,830 SF warehouse:

Building design and construction (with concrete foundation): $30,000	Dimensions: 35’ x 55’ x 10’	Distance to potable water main = 50 feet
Electrical: $16,031	1 restroom (toilet + sink)	Distance to sanitary sewer = 200 feet
Plumbing: $18,000	1 industrial sink	Distance to electrical distribution = 100 feet
Estimated Cost = $34.99/SF		

5,285 SF warehouse:

Building design and construction (with concrete foundation): $70,000	Dimensions: 53’ x 100’ x 10’	Distance to potable water main = 50 feet
Electrical: $27,214	1 restroom (toilet + sink)	Distance to gas = 100 feet
Plumbing: $47,250	2 industrial sinks	Distance to sanitary sewer = 300 feet
Estimated Cost = $27.34/SF	natural gas connection	

Decommission the following wells (Table 5-3):

Well	Total Boring Depth (ft bgs)	Well Diameter (inches)	Well Screen Type
DDC-1*	85.5	15	PVC
DDC-2*	80	15	PVC
DDC-3*	80	15	PVC
TP-1*	80	15	PVC
TP-2*	79	12.25	PVC
TP-3*	80.5	12.25	PVC
TP-4*	80.5	12.25	PVC
TP-5*	80	12.25	PVC
UCD1-008	56	2	PVC
UCD1-009	51.5	2	PVC
UCD1-012	65	4	PVC
UCD1-013	65	4	PVC
UCD1-050	69.5	4	Stainless Steel
UCD1-051	70	4	Stainless Steel
UCD2-014	86	4	PVC

* If nested well, value is the borehole diameter.

Attachment F-9a-8. Clearing and Grubbing - Cost Estimates, UC Davis LEHR/OCL

Clear and Grub Clear all trees and vegetation within footprint of excavation/cap. Used current satellite photo and photographs from recent field activities to estimate amount of vegetation to clear. Assumed all removed material will be stored on-Site for re-use.

LFU-1	Disposal	on-site, chipped
	ACRES	2.4 AC
	FLORA DENSITY	light; 5 trees per acre
LFU-2/ET/WBH	Disposal	on-site, chipped
	ACRES	3.5 AC
	FLORA DENSITY	light; 15 trees per acre
LFU-3	Disposal	on-site, chipped
	ACRES	1.0 AC
	FLORA DENSITY	light; 10 trees per acre
ST/HFSDA	Add to LFU-2/ET/WBH clearing and grubbing cost element	
	Disposal	on-site, chipped
	ACRES	0.4 AC
	FLORA DENSITY	light; 15 trees per acre

Attachment F-9a-9. Demolish LFU-3 Drainage Channel - Cost Estimates, UC Davis LEHR/OCL

Description:

Demolish the LFU-3 N-S concrete lined drainage channel. The drainage area will be re-constructed in its original location post-remediation, but will have a vegetated lining instead of concrete.
The E-W drainage ditch will be destroyed/backfilled during remediation. It will be re-routed south of the LFU-3 area after remediation.

Major Assumptions:

Estimate the volume of concrete to be removed in demolition of Landfill Unit No. 3 N-S drainage channel:

Length (total)	270	ft	
Length (portion to be demolished)	270	ft	
Top Width of channel	30	ft	
Bottom Width of channel	16	ft	
Depth	7	ft	
Thickness of concrete	0.2	ft	
Length of side wall	9.9	ft	
Volume of channel concrete to remove	1,626	ft^3	
	60	CY	convert to CY

Estimated backfill for the current E-W channel in the footprint of the proposed cap:

Length	100	ft	
Top Width of channel	9	ft	
Bottom Width of channel	3	ft	
Depth	3	ft	
Volume to backfill:	2,700	ft^3	
	100	CY	
	140	**CY**	**bulk factor applied**

Excavate ET North and ET South to 8 feet bgs.
Dispose of excavated material off-Site.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET North

Volume		1,171	BCY
Avg. Depth		8	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		1,639	LCY
Safety Level		Level C	

Excavate ET South

Volume		4,799	BCY
Avg. Depth		8.0	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		6,718	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety level C.

Load and Haul

Volume	8,358	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-9a-11. Excavation of ET VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate ET VOC "Hot Spot," east and west to depth of 20 feet bgs.
Dispose of excavated material off-Site. Backfill and compact with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET VOC "Hot Spot," East

Volume		713 BCY
Avg. Depth		20 FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		998 LCY
Safety Level		Level C

Excavate ET VOC "Hot Spot," West

Volume		492 BCY
Avg. Depth		20 FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		689 LCY
Safety Level		Level C

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,686 LCY
One Way Haul Distance	500 FT

Land Survey of Excavation

Survey boundaries of ET VOC "Hot Spot" excavation. 3 man survey crew -One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-9a-12. Excavation of LFU-1 - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-1 Drainage Area and Non-Drainage Area to ten feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-1 Non-Drainage Area

Volume	25,614	BCY
Avg. Depth	10	FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Analytical		
Testing, TAL metals (6010/7000s)	283.50	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
Testing, purgeable organics (624, 8260)	138.95	$/sample
Testing, semi-volatile organics (625, 8270)	465.84	$/sample
Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Off-Site Backfill Required	35,860	LCY
Safety Level	Level D	

Excavate LFU-1 Drainage Area

Volume	7,215	BCY
Avg. Depth	10	FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Analytical		
Testing, TAL metals (6010/7000s)	283.50	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
Testing, purgeable organics (624, 8260)	138.95	$/sample
Testing, semi-volatile organics (625, 8270)	465.84	$/sample
Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Off-Site Backfill Required	35,860	LCY
Safety Level	Level D	

Load and Haul

Volume	45,960	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Land Survey of Excavation

Survey boundaries of Landfill Unit No. 1 excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency	radiological work	15	%

Attachment F-9a-13. Excavation of LFU-2 - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-2 Waste Cells to thirteen feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-2 Waste Cells:

Excavation includes LFU-2 VOC "Hot Spot"			
Volume		30,528	BCY
Avg. Depth		13	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil /	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenc	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liqu	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		42,740	LCY
Safety Level		Level D	

Load and Haul

Load and haul Landfill Unit No. 2 soil and waste to stockpiling areas. Assume stockpile area is to the east of LFU2, assume 500 feet transport distance.

Excavated Volume	42,740	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Land Survey of Excavation

Survey boundaries of Landfill Unit No. 2 excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency

	radiological work	15 %

Attachment F-9a-14. Excavation of LFU-2 VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-2 VOC "Hot Spot" to depth of 20 feet bgs.
Excavated material disposed off-Site. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate LFU-2 VOC "Hot Spot"

Volume		1,210	BCY
Avg. Depth		20	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-tota	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill (On-Site)		0	%
Off-Site Backfill Required		1,693	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments wil be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,693	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of LFU-2 VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-9a-15. Excavation of LFU-3 - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-3 Waste Cells to ten feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-3 Waste Cells:

Volume		9,920 BCY
Avg. Depth		10 FT
Source of backfill	25 mile distance off-Site	13,889 LCY
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)	
Number of composites	default	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		13,889 LCY
Safety Level		Level D

Load and Haul

Volume	13,889 LCY
One Way Haul Distance	500 FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Land Survey of Excavation

Survey boundaries of excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency

radiological work	15 %

Excavate the ST and HFSDA. Backfill the excavations with clean fill.

Segregate and dispose of the PTW off-Site and dispose of non-PTW material in the on-Site capped WBH CAMU.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate ST

Volume		1,562	BCY
Avg. Depth		6	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	default, 1 per 625 ft² (25 ft x 25 ft grid)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		2,186	LCY
Safety Level		Level D	

Excavate HFSDA

Volume		461	BCY
Avg. Depth		6	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft² (25 ft x 25 ft grid) (default)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		646	LCY
Safety Level		Level D	

Load and Haul

Load and haul ST and HFSDA soil and waste to stockpiling areas. Assume stockpile area is to the north of ST, assume 500 feet transport distance.

Excavated volume	2,832	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety level C.

Land Survey of Excavation

Survey boundaries of ST and HFSDA excavations. 3 man survey crew - 2 half-days. Licensed surveyor report.

Contingency

radiological work	15	%

Materials management includes activities related to the management of excavated soil and solid waste (i.e., stockpiling, sifting/sorting, waste characterization, and staging prior to final disposal).

Bulk Material Storage

Accommodate total excavated volume (TEV) across all subareas to allow for sorting, waste characterization, and staging. Stockpile excavated material in bermed, covered storage area. Safety Level D.

TEV (from subareas excavated under this alternative)	117,158	LCY

Sifting of Excavated Material

Assume rate of sifting = 200 CY/day

Assume the use of similar equipment used under the MEC Sifting assembly. Material will be segregated into PTW, biological waste, and LTW waste streams. Safety Level C.

Soil/solid waste volume (PTW, biological waste, and LTW waste streams):	86,186	LCY
Trommel Screener	11	month
Grizzly Shaker Unit	11	month
Conveyors,	2	unit
Refuse Bottom Hopper	2	unit
5'x16' Double tray Vibrating Screening Unit	2	unit
Two full-time equipment operators, oilers (per screening operation)	7,199	hrs

Loader for Staging Area

One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled material needs to be moved. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

950, 3.0 CY, Wheel Loader (active)	2,200	hours
950, 3.0 CY, Wheel Loader (standby)	2,200	hours
Bobcat with Backhoe	22	month
All Terrain Forklift (Monthly Rental)	22	month

Waste Characterization

Assume the included materials and analyses for waste characterization prior to final disposal of excavated materials. (ET PTW and ET VOC Hotspot excavated material) 1 sample per 300 CY.

Material to be characterized:	ST PTW and TEV from ET North, ET South, ET VOC "Hot Spot," LFU-1, LFU-2 Waste Cells, LFU-2 VOC "Hot Spot," LFU-3 Waste Cells	
Total Volume	114,348	LCY
Sampling rate	1	sample/300 CY (or 1 sample per container)
Number of samples	382	
Analytical suite:		
Testing, TAL metals (6010/7000s)	257.73	$/sample
TCLP (RCRA) (EPA 1311), Soil Analysis	120.30	$/sample
Testing, soil & sediment analysis, BTEX/gasoline hydrocarbons mod EPA 8020 (PID/FIFD)	107.37	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	234.37	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	278.01	$/sample
Purgeable organics (624, 8260)	126.31	$/sample
Testing, semi-volatile organics, pkd. column (8250)	416.14	$/sample
Testing, paint filter liquids test (9095)	27.90	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, ignitibility (1010)	31.64	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, corrosivity (1110, NACE)	26.04	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, reactivity (cyanide/sulfide)	72.65	$/sample
Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic	133.34	$/sample
Testing, rad analytical, additional services, characterization of any unknown rad sample (low level)	194.36	$/sample

Drum Staging

Drums for PTW laboratory waste (lab pack) disposal. Includes characterization of wastes in drums. Assume number of drums = volume of PTW in LCY divided by four. Safety Level C.

Total PTW	1,116	LCY
Bulk Containers for Storage of PTW	41	containers (30 CY capacity)
Number of drums	279	
Percentage Full	65	%
Temporary Storage Area	3,256	ft²
Overpacks	85 gal. steel salvage drum	
Waste characterization	1 sample per drum, liquid waste characterization template	

Attachment F-9a-18. Excavated Materials Consolidation - Cost Estimates, UC Davis LEHR/OCL

CAMU	Volume to Consolidate [LCY]
WBH CAMU	2,809

Attachment F-9a-19. Off-Site Transportation and Disposal - Cost Estimates, UC Davis LEHR/OCL

	LLRW (LCY)	**Mixed Waste** (LCY)	**RCRA Hazardous** (LCY)	**Non-RCRA Hazardous** (LCY)	**Non-Hazardous** (LCY)	**Building Hazardous** (LCY)	**Building Non-Hazardous** (LCY)	**Drums/Lab Pack** (number of drums)
Distance to disposal facility	594 miles	594 miles	227 miles	227 miles	93 miles	227 miles	93 miles	594 miles
Volume*	40,187	2,142	49,124	7,336	15,558	45	838	
Volume for Incineration**	312	0	0	0	0	0	0	
Final Disposal Volumes	**39,875**	**2,142**	**49,124**	**7,336**	**15,558**	**45**	**838**	**279**

* See Table E-13 (Appendix E, FS - Volume 1).
** Biological waste only.

Attachment F-9a-20. Install Waste Burial Holes Multiple-layer Cap - Cost Estimates, UC Davis LEHR/OCL

Description: Construct multiple-layer cap over the WBH CAMU.
Major Assumptions:

Area:	0.6	acres
Thickness:	3.5	ft
Side slope:	3:1	(maximum)
Layers:		

vegetative cover	6	inches
protection layer (clean fill/soil)	24	inches
Drainage layer (geocomposite)	-	inches
40 mil HDPE geomembrane	-	inches
Compacted Clay Layer (geosynthetic clay liner	-	inches
foundation soil layer	12	inches
waste material		

Capacity of CAMU to receive waste on top of current grade and underneath cap:
2,933 CY

Volume to compact (above grade and underneath cap):
2,809 LCY

Surveying of Cap:

Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foundation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetative cover is added). Markers would be added to the cap for monitoring of settlement. Licensed surveyor report. 3 man survey crew - 4 half-days. Licensed surveyor report.

Attachment F-9a-21. Install New Groundwater Wells - Cost Estimates, UC Davis LEHR/OCL

Groundwater Well Installation - Nine HSU-1 groundwater monitoring wells and one HSU-2 groundwater monitoring well would be installed. The wells will have screen/sand pack intervals of seven feet or less to minimize their potential to act as vertical conduits for downward COC migration, and will be completed just below the bottom of the depth range of seasonal water table fluctuation. In addition, it is assumed that three density-driven convection (DDC) wells and three nested piezometers would be installed as replacements for those decommissioned in the ET North.

9 HSU-1 wells, 70 ft depth, 2" diameter, PVC Schedule 80
1 HSU-2 well, 105 ft depth, 4" diameter, PVC Schedule 80
3 DDC wells, 90 ft depth, 15" diameter borehole. Each DDC well assumed to include:
- Recirculating well: 90 ft depth, 4" diameter, PVC Schedule 80
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 30 ft depth
  - Intermediate: 52 ft depth
  - Deep: 76 ft depth
- Air Injection Tubing: 90 ft depth + 35 feet to blower, 1.25" diameter, PVC Schedule 80
- Vapor Return Line: 50 feet to discharge pipe, 2" diameter, PVC Schedule 80
- Acid Drip Line: 50 feet to acid storage, 0.75" diameter, PVC Schedule 80

3 Sets of Nested Piezometers, 80 ft depth, 15" diameter borehole. Each set of piezometers assumed to include:
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 35 ft depth
  - Intermediate: 53 ft depth
  - Deep: 80 ft depth

Dispose drill cuttings as non-hazardous waste
Survey and develop completed wells

Attachment F-9a-22. Storm Drainage Controls - Cost Estimates, UC Davis LEHR/OCL

LFU-1 Storm Drainage

North-south trending vegetated swale will be constructed to east of capped and lined CAMU.

Lining:	soil/vegetation	
Length	400	feet
Erosion Controls - Geotextile	326	yd^2
Erosion Controls - Rip-rap	24	CY

LFU-3 N-S Drainage Channel

North-south trending concrete-lined drainage channel will be reconstructed to match original dimensions.

Length	270	ft
Top Width	30	ft
Bottom Width	16	ft
Depth	7	ft

Length of north-south drainage channel to reconstruct	270	ft
Lining	soil/vegetation	
Erosion Controls - Geotextile	652	yd^2
Erosion Controls - Rip-rap	64	CY

LFU-3 E-W Drainage Ditch

Re-route the east-west vegetated drainage ditch to the south of LFU-3. Install new culvert to discharge into north-south, concrete-lined drainage channel.

Lining:	soil/vegetation	
Length	260	ft
Top Width	15	ft
Depth	3	ft
Erosion Controls - Geotextile	212	yd^2
Erosion Controls - Rip-rap	16	CY

Survey :

Survey newly constructed drainage channels and detention basins. One half-day. Registered surveyor report.

Attachment F-9a-23. O&M: Institutional Controls - Cost Estimates, UC Davis LEHR/OCL

Perform initial survey to establish legal boundaries of Site.
Implement and maintain land use controls.
Document waste placement locations and prohibit site development or activities incompatible with designated land use.

		# meetings	# people	# days	airfare	mileage to meeting site
Planning Documents	LUC Assurance Plan	2	2	1	0	70
	LUC Implementation Plan	2	2	1	0	70
	Construction Permitting	1	1	1	0	70
	Geographic Information Systems/Overlay Maps	1	1	1	0	70
Implementation	Deed Notification	1	unit			
	Restrictive Covenants	1	unit			
	Access Control Signs	22	unit	Assume one sign every 150 feet around perimeter of land disposal units		
	Utility Notification Service	1	unit			
	GIS/Overlay maps	1	unit			
Monitoring and Enforcement						
	Duration of monitoring/enforcement	100	YRS (or lifetime of alternative)			
	Reports & Certifications	1	per year			
	Site Visits/Inspections	1	per year			
Survey:	5 days, licensed surveyors' report					

Attachment F-9a-24. O&M: Groundwater and Storm Water Monitoring - Cost Estimates, UC Davis LEHR/OCL

Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the land disposal units according to Table 5-3. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, semivolatile organic compounds (1,4-dioxane by single ion monitoring) CAM 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three designated storm water sampling locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. The groundwater and storm water monitoring period will continue throughout the lifetime of the alternative until Site cleanup goals are achieved.

Includes data validation, electronic data import, data management and monitoring reports.
16 wells to be included.

Attachment F-9a-25. O&M of Storm Water Drainage Infrastructure - Cost Estimates, UC Davis LEHR/OCL

Assume annual maintenance costs of $1,000/year for lifetime of drainage system.

Includes LFU-1 drainage swale and LFU-3 drainage channels

Attachment F-9a-26. O&M of Multiple-layer Caps - Cost Estimates, UC Davis LEHR/OCL

Inspect and repair caps for lifetime of cap. Assumes some erosion and settlement, but no large scale failure.
RACER bases costs on total area of caps.

Total Capped Area: 0.57 acres

Attachment F-9a-27. Periodic Costs: Five Year Reviews - Cost Estimates, UC Davis LEHR/OCL

Review and update all documents associated with compliance, performance, land use controls. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews for period of 30 years

Document Review	
Interviews	Current and Previous Staff Management
	Community Groups
	State Contacts
	Local Government Contacts
	Operations & Maintenance Contractors
	PRPs
	Remedial Design Consultant
Site Inspection	General Site Inspection
	Containment System Inspection
	Monitoring Systems Inspection
	Treatment Systems Inspection
	Regulatory Compliance
	Site Visit Documentation (Photos, Diagrams, etc.)
Report	

ATTACHMENT F-9b

ALTERNATIVE SW-9 ESTIMATE DOCUMENTATION REPORT

Estimate Documentation Report

System:

RACER Version: 10.3.0
Database Location: C:\Documents and Settings\gch\Application Data\AECOM\RACER 10.3\Racer.mdb

Folder:

Folder Name: Alternative SW-9

Project:

Project ID: FS_Cost
Project Name: Feasibility Study Cost Estimate
Project Category: Detailed Analysis of FS Alternatives

Location
State / Country: CALIFORNIA
City: SACRAMENTO

Location Modifier	Default	User
	1.203	1.203

Options
Database: Modified System
Cost Database Date: 2010
Report Option: Calendar

Description
Cost estimates in support of the CERCLA Feasibility Study for University of California, Davis areas of responsibility at the Laboratory for Energy-Related Health Research/Old Campus Landfill Site. Use Modified System Costs to add custom cost assemblies.

Estimate Documentation Report

Site Documentation:

Site ID: LEHR/OCL
Site Name: Alternative SW-9
Site Type: Land Disposal Units

Media/Waste Type
Primary: Soil
Secondary: N/A

Contaminant
Primary: Multi-Contaminant
Secondary: Radioactive (Low Level)

Phase Names
Pre-Study:
Study:
Design:
Removal/Interim Action:
Remedial Action:
Operations & Maintenance:
Long Term Monitoring:
Site Closeout:

Documentation
Description: Alternative SW-9. Excavate and Dispose of Waste Off-site, Waste Burial Holes Corrective Action Management Unit with Multiple-Layer Cap, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring.

See Section 5 of the FS for a description of this alternative.
Support Team: Weiss Staff
References: RACER 2010 System Costs Database

Estimate Documentation Report

Estimated Costs:

Phase Names	Direct Cost	Marked-up Cost
Biological Survey	$34,759	$86,304
Decontamination Facilities	$520,561	$1,157,352
Institutional Controls	$445,672	$1,039,283
Building D&D	$319,118	$511,850
Elderberry Mitigation	$270,000	$270,000
Clearing and Grubbing	$29,533	$54,151
Decommission GW Monitoring Wells	$440,895	$624,402
ET Excavation	$424,536	$690,687
ET VOC "Hot Spot" Excavation	$156,452	$252,758
Materials Management	$4,503,065	$7,259,526
Demolish LFU-3 N-S Drainage Channel	$6,850	$10,264
Excavated Material Consolidation	$5,642	$9,549
LFU-3 Excavation	$547,716	$893,073
LFU-1 Excavation	$1,675,188	$2,775,120
ST and HFSDA Excavation	$134,585	$206,155
LFU-3 Drainage Channels	$50,707	$91,539
Off-Site Transportation and Disposal	$64,187,269	$77,135,180
LFU-1 Drainage Swale	$10,442	$18,841
LFU-2 VOC "Hot Spot" Excavation	$156,716	$253,312
LFU-2 Excavation	$1,580,453	$2,619,614
WBH Cap	$209,304	$338,380
Install New GW Monitoring Wells	$206,121	$297,551
Building Reconstruction	$423,616	$423,616
Groundwater and Storm Water Monitoring	$2,799,569	$3,775,150
O&M Drainage System	$1,000	$1,000
O&M of Caps	$169,643	$369,850
Five-Year Reviews	$63,558	$159,250
Total Cost:	$79,372,968	$101,323,756

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Biological Survey
Description: Perform biological survey of Site prior to remedial action to assess population abundance and diversity of selected plant and animal species.

Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
RCRA Facility Investigation	Yes	100	0

Total Marked-up Cost: $86,304

Technologies:

Estimate Documentation Report

Technology Name: **RCRA Facility Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		No	n/a
Other Investigations		No	n/a
Site Distance		70	MI
Site Complexity		Low	n/a
Site Charact.			
Required Parameters			
Fieldwork Support		No	n/a
Evaluate Site Geology/Hydrogeology		No	n/a
Evaluate Site Soils/Surface Hydrology		No	n/a
Evaluate Site Meteorology		No	n/a
Evaluate Populations and Land Usage		No	n/a
Evaluate Site Ecology		Yes	n/a
Evaluate Nature and Extent of Contamination		No	n/a
Evaluate Contaminant Fate and Transport		No	n/a
Conduct Baseline Risk Assessment		No	n/a
Compose RFI Report		Yes	n/a

Comments: On-Site biological survey with particular emphasis on threatened and endangered species prior to commencement of any remedial activities.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Institutional Controls
Description: Implement and maintain Institutional/Land Use Controls to prohibit Site development or activities incompatible with designated land use.

Approach: In Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
INITIAL LAND SURVEY	Yes	5	95
ADMINISTRATIVE LAND USE CONTROLS	Yes	100	0

Total Marked-up Cost: $1,039,283

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **INITIAL LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		INITIAL LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew to establish legal boundaries defining the Site's boundaries. Licensed surveyor report. 3 man survey crew - 5 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Rename Model		ADMINISTRATIVE LAND USE CONTROLS	n/a
Planning Documents		Yes	n/a
Planning Documents: Start Date		2010	n/a
Implementation		Yes	n/a
Implementation: Start Date		2010	n/a
Monitoring & Enforcement		Yes	n/a
Monitoring & Enforcement: Start Date		2010	n/a
Modification/Termination		No	n/a
Type of Site		Former Government Site	n/a
Planning Documents			
Required Parameters			
LUC Assurance Plan (LUCAP)		Yes	n/a
LUC Assurance Plan (LUCAP): Plan Complexity		Medium	n/a
LUC Implementation Plan (LUCIP)		Yes	n/a
LUC Implementation Plan (LUCIP): Number		1	EA
LUC Implementation Plan (LUCIP): Plan Complexity		Medium	n/a
Long-term Stewardship (LTS) Plan		No	n/a
Memorandum of Agreements (MOA)		No	n/a
Installation (or City) Master Plan		No	n/a
Construction Permitting		Yes	n/a
Construction Permitting: Number		1	EA
Construction Permitting: Plan Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Plan Complexity		Low	n/a
Planning Meetings			
Required Parameters			
LUCAP: Number of Meetings		2	EA
LUCAP: Number of People		2	EA

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Planning Meetings			
Required Parameters			
LUCAP: Number of Days		1	EA
LUCAP: Airfare Cost		0	$
LUCAP: Mileage to Meeting Site		70	MI
LUCIP: Number of Meetings		2	EA
LUCIP: Number of People		2	EA
LUCIP: Number of Days		1	EA
LUCIP: Airfare Cost		0	$
LUCIP: Mileage to Meeting Site		70	MI
Construction Permitting: Number of Meetings		1	EA
Construction Permitting: Number of People		1	EA
Construction Permitting: Number of Days		1	EA
Construction Permitting: Airfare Cost		0	$
Construction Permitting: Mileage to Meeting Site		70	MI
GIS/Overlay Maps: Number of Meetings		1	EA
GIS/Overlay Maps: Number of People		1	EA
GIS/Overlay Maps: Number of Days		1	EA
GIS/Overlay Maps: Airfare Cost		0	$
GIS/Overlay Maps: Mileage to Meeting Site		70	MI
Implementation			
Required Parameters			
Modify Installation (or City) Master Plan		No	n/a
Deed Notification		Yes	n/a
Deed Notification: Number		1	EA
Deed Notification: Task Complexity		Low	n/a
Negotiating Easements		No	n/a
Restrictive Covenants		Yes	n/a
Restrictive Covenants: Number		1	EA
Restrictive Covenants: Task Complexity		Low	n/a
Equitable Servitudes		No	n/a
Access Control Signs		Yes	n/a

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Implementation			
Required Parameters			
Access Control Signs: Number		22	EA
Access Control Signs: Task Complexity		Low	n/a
Utility Notification Service		Yes	n/a
Access Control Signs: Number		1	EA
Access Control Signs: Task Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Task Complexity		Low	n/a
Develop Finding of Suitability to Transfer (FOST)		No	n/a
Monitoring & Enforcement			
Required Parameters			
Duration of Monitoring/Enforcement		31	Years
Notice Letters		No	n/a
Guard Service/Security		No	n/a
Reports & Certifications		Yes	n/a
Reports & Certifications: Frequency		Annually	n/a
Site Visits/Inspections		Yes	n/a
Site Visits/Inspections: Number		1	EA
Site Visits/Inspections: Safety Level		D	n/a
Site Visits/Inspections: Duration		1	Days
Site Visits/Inspections: Number of People		2	EA
Site Visits/Inspections: Frequency		Annually	n/a
Site Visits/Inspections: Airfare		0	$ Per Ticket
Site Visits/Inspections: Mileage		70	MI

Comments: Implement and maintain land use controls to prohibit Site development or activities incompatible with designated land use.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decontamination Facilities
Description: Provide decontamination facilities for equipment and personnel throughout duration of the remedial action.

Approach: Ex Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Decontamination Facilities	Yes	100	0

Total Marked-up Cost: $1,157,352

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		1,102,240	$
Percentage	17.9	5	%
Dollar Amount		55,112	$

Comments:

Estimate Documentation Report

Technology Name: **Decontamination Facilities (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
New Decontamination Facility Pad Construction		No	n/a
Equipment Rating		n/a	n/a
Equipment Decontamination Operations		Yes	n/a
Equipment Decontamination Operations: Duration		72	weeks
Personnel Decontamination Trailers		Yes	n/a
Personnel Decontamination Trailers: Average Crew Size		10	per shift
Personnel Decontamination Trailers: Duration		72	weeks
Safety Level		D	n/a
Work Shifts			
Secondary Parameters			
Equipment Decontamination	One Shift per Day		n/a
Personnel Decontamination	One Shift per Day		n/a

Comments: Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 72 weeks.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Elderberry Mitigation
Description: Identify elderberry shrub clusters within work boundaries and relocate them within UC boundaries.

Approach: None
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ELDERBERRY SHRUB CLUSTER RELOCATION	No	0	0

Total Marked-up Cost: $270,000

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **ELDERBERRY SHRUB CLUSTER RELOCATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ELDERBERRY SHRUB CLUSTER RELOCATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.02	n/a
Safety Level		D	n/a

Comments: Cost for Elderberry mitigation based on previous transplanting operations at UC Davis.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building D&D
Description: Prior to implementation of the alternative, nine Site buildings will be demolished and associated demolition material will be disposed off-Site. It is assumed that five percent of the demolition waste is contaminated with asbestos, lead, and PCBs. Non-hazardous building material will be recycled or disposed of off-Site. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated.
Apply 15% contingency for worker safety and additional waste volume.

Approach: Ex Situ
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Professional Labor Management	Yes	100	0
D&D, Sampling and Analysis	Yes	100	0

Total Marked-up Cost: $511,850

Technologies:

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		630	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		33.25	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		1.75	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		1,200	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		63.65	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		3.35	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose storage building (H-253) near northwest corner of Landfill No. 3. Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		191,492	$
Percentage	19.8	19.8	%
Dollar Amount		37,915	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Mobilizations		1	EA
Mobilization Distance		70	MI (One-way)
Soil/Sediment: # of Samples		0	EA
Soil/Sediment: Survey Area		0	SF
Water/Liquid: # of Samples		0	EA
Water/Liquid: Survey Area		0	SF
Building Surfaces: # of Samples		141	EA
Building Surfaces: Survey Area		43,287	SF
Sampling Rate		75	Per Day
Sampling Crew Size		2 Radiation Technicians, 1 Health and Safety Officer	n/a
Safety Level		D	n/a
Laboratory Analyses			
Required Parameters			
Soil: Alpha		No	n/a
Soil: Beta		No	n/a
Soil: Gamma		No	n/a
Soil: VOC"s		No	n/a
Soil: SVOC"s		No	n/a
Soil: Fuels		No	n/a
Soil: Pesticides		No	n/a
Soil: PCB"s		No	n/a
Soil: Metals		No	n/a
Soil: Acids/Caustics		No	n/a
Soil: Ordnance Residual		No	n/a
Water: Alpha		No	n/a
Water: Beta		No	n/a
Water: Gamma		No	n/a
Water: VOC"s		No	n/a
Water: SVOC"s		No	n/a

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Laboratory Analyses			
Required Parameters			
Water: Fuels		No	n/a
Water: Pesticides		No	n/a
Water: PCB"s		No	n/a
Water: Metals		No	n/a
Water: Acids/Caustics		No	n/a
Water: Ordnance Residual		No	n/a
Building: Alpha		No	n/a
Building: Beta		No	n/a
Building: Gamma		No	n/a
Building: VOC"s		No	n/a
Building: SVOC"s		No	n/a
Building: Fuels		No	n/a
Building: Pesticides		No	n/a
Building: PCB"s		Yes	n/a
Building: Metals		Yes	n/a
Building: Acids/Caustics		No	n/a
Building: Ordnance Residual		No	n/a
QA Blanks: Soil/Sediment		0	%
QA Blanks: Water/Liquid		0	%
QA Blanks: Building		15	%
Hand Scanning		1	Days
Adjustments/Productivity			
Secondary Parameters			
Turnaround Time		Standard (21 Days)	n/a
Quality Control		Level 1	n/a
Height Adjustment	15	15	%
Protective Clothing	23	23	%
RADCON	15	15	%
Respiratory Protection	38	38	%
Breaks	10	10	%

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Adjustments/Productivity			
Secondary Parameters			
Productivity Loss Multiplier	2.32	n/a	n/a

Comments: Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. One sample per ~300 ft2. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals. At two Geriartics Buildings H-292 and H-293, include radiological analyses.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decommission GW Monitoring Wells
Description: Decommission groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Residual Waste Management	Yes	80	20
Well Abandonment	Yes	20	80

Total Marked-up Cost: $624,402

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		594,669	$
Percentage	19	5	%
Dollar Amount		29,733	$

Comments:

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		41	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Estimate Documentation Report

Technology Name: **Well Abandonment (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Abandon Wells			
Required Parameters			
Technology/Group Name		DDC Wells	n/a
Number of Wells		3	EA
Well Depth		85	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		TP-1 through TP-5	n/a
Number of Wells		5	EA
Well Depth		81	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-1 Wells	n/a
Number of Wells		6	EA
Well Depth		64	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-2 Well	n/a
Number of Wells		1	EA
Well Depth		86	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a

Comments:

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Clearing and Grubbing
Description: Clear and grub areas to be excavated and/or capped.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80

Total Marked-up Cost: $54,151

Technologies:

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		2.42	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		424.830993652344	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 1 footprint.
Current satellite photo and photographs from recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume grubbed material will be kept on-site for re-use.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		3.88	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		681.134033203125	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 2/Eastern Trenches/Southern Trenches/Waste Burial Holes/HFSDA footprint.
Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume chipping and stockpiling is done on-site.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		1.01	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		177.30549621582	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear trees and vegetation at Landfill Unit 3. Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range. Assume grubbed material is stored and re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET Excavation
Description: Excavate waste cell contents in ET North and ET South, including contact soil and surrounding contaminated soil to depth of waste plus 2 feet overexcavation (use avg. trench depth + 2 feet for costing purposes). Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Load and haul ET excavated material to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work and backfill requirements.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Excavation	Yes	5	95

Total Marked-up Cost: $690,687

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 4 x 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		8,358	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET excavated material to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		542,547	$
Percentage	19.1	19.1	%
Dollar Amount		103,626	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,171	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	10	10	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate ET North. Average waste cell depth = 8 ft bgs.

Collect confirmation samples.

Backfill and compact with clean imported fill.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		4,799	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	12	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	33	33	EA
Number of Composites Submitted to Lab	9	9	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate ET South.

Confirmation sampling.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Materials Management
Description: Excavated material will be handled in accordance with a Materials Management Plan. Materials Management includes the cost of storage/stockpiling, sorting of waste streams, waste characterization, and staging for final disposal. Disposal is handled in a separate cost element. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Bulk Material Storage	Yes	20	80
Bulk Material Storage	Yes	20	80
SIFTING OF EXCAVATED MATERIAL	Yes	20	80
Drum Staging	Yes	20	80
LOADER FOR STAGING AREA	Yes	0	100
WASTE CHARACTERIZATION SAMPLING	Yes	100	0
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $7,259,526

Technologies:

Estimate Documentation Report

Technology Name: **Bulk Material Storage (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Roll-Off/Bulk Containers/Tanks	n/a
Quantity of Material		1,116	CY
Safety Level		C	n/a
Secondary			
Secondary Parameters			
Size	30 CY Open Top Roll-Off Container	30 CY Open Top Roll-Off Container	n/a
Quantity	42	41.33333	n/a

Comments: Bulk containers for PTW.

Estimate Documentation Report

Technology Name: **Bulk Material Storage (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Soil Bermed Storage Area	n/a
Quantity of Material		117,158	CY
Safety Level		D	n/a
Secondary			
Secondary Parameters			
Storage Area Quantity	1	1	EA
Storage Area Length	385	385	FT
Storage Area Width	385	385	FT
Berm Height	2	2	FT
Berm Top Width	2	2	FT
Slope: Feet Run / 1 Foot Rise	3	3	FT
Polymeric Liner Material	40 Mil Polymeric Liner, PVC	40 Mil Polymeric Liner, PVC	n\a
Polymeric Liner Quantity	1	1	EA
Soil Liner Material	None	None	n/a
Soil Liner Thickness	0	0	IN
Liner Protection Layer Material	Gravel	Gravel	n/a
Liner Protection Layer Thickness	12	12	IN

Comments: Stockpile TEV.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **SIFTING OF EXCAVATED MATERIAL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		SIFTING OF EXCAVATED MATERIAL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.90	n/a
Safety Level		C	n/a

Comments: Sorting of excavated material to segregate principal threat wastes. Assume the use of similar equipment used under the MEC Sifting assembly. Assume rate of sorting is approximately 200 CY/day.

Estimate Documentation Report

Technology Name: **Drum Staging (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Waste		Solid	n/a
Solid: To be Staged		279	EA
Solid: Leaking/Damaged Requiring Overpacks		0	EA
Solid: To be Sampled		279	EA
Solid: Second Sample per Drum		No	n/a
Temporary Staging Area		3,256	SF
Drums to be Consolidated (Drums to Bulk)		279	EA
Drum Average Percentage Full		65	%
Safety Level		C	n/a
Handling			
Secondary Parameters			
Overpacks		85 Gal. Steel Salvage Drum	n/a
First Sample Analysis: Liquid		Waste Characterization, Liquid	n/a
First Sample Analysis: Solid / Sludge		Waste Characterization, Solids Includes Rads	n/a
Second Sample Analysis: Liquid		None	n/a
Second Sample Analysis: Solid / Sludge		None	n/a
Storage			
Secondary Parameters			
Liner/Temporary Staging Area	60 Mil Polymeric Liner, HDPE	60 Mil Polymeric Liner, HDPE	n/a
Drum Storage Systems: Quantity	0	0	EA
Drum Storage Systems: Type	Poly Spill Pallet, 4 Drum Cap	Poly Spill Pallet, 4 Drum Cap	n/a
Containment Berms: Quantity	0	0	EA
Containment Berms: Type	10" x 10" x 17", 750 Gallon	10" x 10" x 17", 750 Gallon	n/a

Comments: Drums for principal threat wastes/lab packs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **LOADER FOR STAGING AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LOADER FOR STAGING AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled dirt needs to be moved around. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

Technology Name: **User Defined Estimate (# 3)**
User Name: **WASTE CHARACTERIZATION SAMPLING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WASTE CHARACTERIZATION SAMPLING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.06	n/a
Safety Level		D	n/a

Comments: Assume the included materials and analyses for waste characterization prior to final disposal of ST PTW and TEV from other excavated areas.
Assume 1 sample per 300 CY for costing purposes only. Actual sampling rate will be considered during remedial design.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		2,293,293	$
Percentage	15.6	15.6	%
Dollar Amount		357,754	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET VOC "Hot Spot" Excavation
Description: Excavate ET VOC "Hot Spot." Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Rad work_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95

Total Marked-up Cost: $252,758

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,686	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		199,844	$
Percentage	19.8	19.8	%
Dollar Amount		39,569	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,204	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	52	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	9	9	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate the ET VOC "Hot Spot" to a depth of 20 feet bgs.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Demolish LFU-3 N-S Drainage Channel
Description: The concrete lined drainage channel which partially overlays LFU-3 will be removed.
New N-S drainage channels will be re-constructed post-remediation.
This cost estimate assumes that a termporary drainage channel will not have to be created since the remedial action will take place in the dry season.

Approach: Ex Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
DEMOLISH LFU3 N-S DRAINAGE CHANNEL	Yes	100	0

Total Marked-up Cost: $10,264

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **DEMOLISH LFU3 N-S DRAINAGE CHANNEL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DEMOLISH LFU3 N-S DRAINAGE CHANNEL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.01	n/a
Safety Level		D	n/a

Comments: Demolish gunnite lined north-south drainage channel overlaying Landfill Unit 3. Assume thickness of gunnite lining = 2 inches, length of channel is 270 feet, top width of channel is 30 feet, base width of channel is 16 feet, depth of channel is 7 feet. Assume 270 feet of the channel will need to be demolished. The channel will be demolished to remove underlying waste. The channel will be restored in its original location, but without concrete lining. Demolished concrete will be re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Excavated Material Consolidation
Description: Consolidate non-PTW excavated material from excavations in on-Site CAMUs. 10% contingency applied for consolidation of additional volume.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency Markup 10%_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
CONSOLIDATE WASTE IN LINED AND CAPPED CAMU	Yes	5	95

Total Marked-up Cost: $9,549

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **CONSOLIDATE WASTE IN LINED AND CAPPED CAMU**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		CONSOLIDATE WASTE IN LINED AND CAPPED CAMU	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Consolidate waste in WBH CAMU.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Excavation
Description: Excavate LFU-3 waste cells. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean import soil. Revegetate surface. Load and haul Landfill Unit 3 soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $893,073

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		695,026	$
Percentage	18.8	18.8	%
Dollar Amount		130,665	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		9,920	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	12	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	54	54	EA
Number of Composites Submitted to Lab	14	14	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 3 waste cells.
Collect default number of confirmation samples.
Import clean fill from offsite source. Backfill and compact import soil. Revegetate surface.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		13,889	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul Landfill Unit 3 excavated material to stockpiling areas. Assume stockpile area is immediately adjacent to LFU-3 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Landfill Unit 3 excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Excavation
Description: Excavate LFU-1. Conduct land survey of on-Site backfill locations/volumes. 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: June, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0

Total Marked-up Cost: $2,775,120

Technologies:

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		2,246,094	$
Percentage	15.7	15.7	%
Dollar Amount		352,637	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		32,829	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	7	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	163	163	EA
Number of Composites Submitted to Lab	41	41	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 1 Non-Drainage Area and LFU-1 Drainage Area.
Collect confirmation samples.
Backfill/compact clean import soil to promote drainage, assume 0% of excavated material used as backfill.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		45,960	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul Landfill Unit 1 excavated material to stockpiling areas.
Assume stockpile area is immediately adjacent to LFU-1 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Landfill Unit 1 excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ST and HFSDA Excavation
Description: Excavate ST and HFSDA.
Confirmation samples will be collected after excavation.
Backfill and compact clean fill in ST and HFSDA excavation footprint.
Conduct land survey of excavation boundaries.
Assumes 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: June, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	100	0
Load and Haul	Yes	20	80
Excavation	Yes	100	0
EXCAVATED MATERIAL MONITORING	Yes	100	0
LAND SURVEY OF EXCAVATION	Yes	10	90
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $206,155

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		461	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	6	6	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: The HFSDA will be excavated, and excavated material will be disposed off-Site. Confirmation samples will be collected. The excavation will be backfilled with clean fill and will be re-seeded.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		2,832	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ST and HFSDA soil and waste to stockpiling areas. Assume stockpile area is to the north of ST, assume 500 feet transport distance.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,562	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	14	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	15	15	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Southern Trenches will be excavated. ST will be backfilled with clean fill and will be re-seeded.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of ST and HFSDA excavation. 3 man survey crew - 2 x 1/2 days. Survey crew would have to come out during different phases of the excavation (assume 3 different times). Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		156,640	$
Percentage	19.8	19.8	%
Dollar Amount		31,015	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Drainage Channels
Description: The concrete lined drainage channel which partially overlays LFU-3, will be reconstructed post-remediation.
The E-W LFU-3 drainage channel will also be reconstructed south of its original location.

Approach: Ex Situ
Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
E-W DITCH CONSTRUCTION	Yes	20	80
N-S DRAINAGE CHANNEL CONSTRUCTION	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $91,539

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **E-W DITCH CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		E-W DITCH CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Construction of new east-west drainage ditch at LFU-3, south of its original location. Assume 260 feet needed. This drainage ditch currently drains the Raptor Center and vicinity. It will discharge into the larger N-S concrete lined drainage ditch.

Technology Name: **User Defined Estimate (# 2)**
User Name: **N-S DRAINAGE CHANNEL CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		N-S DRAINAGE CHANNEL CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Reconstruction of north-south, drainage ditch. Assume 270 feet need to be restored. Dirt/grass lining.

Technology Name: **User Defined Estimate (# 3)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage channels. 2 x 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Off-Site Transportation and Disposal
Description: Transport and dispose of RCRA hazardous, mixed waste, Non-RCRA hazardous, LLRW, and non-hazardous waste material generated by Site remedial excavations. Hazardous wastes will be transported to Class I hazardous waste facility; solid LLRW and mixed waste to LLRW accepting facility; and non-hazardous materials at Class II non-hazardous landfill. Assume drummed PTW will be sent to the LLRW accepting facility, and biological waste will be incinerated.

Approach: Ex Situ
Start Date: September, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Off-site Transportation and Thermal Treatment	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0

Total Marked-up Cost: $77,135,180

Technologies:

Estimate Documentation Report

Technology Name: **Off-site Transportation and Thermal Treatment (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid		312	CY
Distance to Off-site Facility (One-way)		2,433	MI
Safety Level		D	n/a
Treatment Type			
Required Parameters			
Treatment Type		Incineration	n/a
Treatment Fees			
Secondary Parameters			
Type of Treatment Fees	Average Treatment Fee	Average Treatment Fee	n/a
Amount of Treatment Fees	1,300	1,300	$/CY
Amount of State Tax/Fee (for Hazardous Waste)	0	0	$/CY

Comments: Incinerate biological waste sent for off-Site disposal.

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Non-leaking Drums	n/a
Quantity of Non-Leaking Drums		279	Drums
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dipose of drums containing PTW requiring stabilization. Assume default acceptance and treatment fee. Assume 594 mile transport distance.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Low-Level Radioactive Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		39,875	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose LLRW. Assume $1,080/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Mixed Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		2,142	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose mixed waste. Assume $2,814/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		49,124	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose RCRA hazardous waste. Assume $170/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		7,336	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose non-RCRA hazardous waste. Assume $85/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		15,558	CY
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	MI
Safety Level		D	n/a

Comments: Transport and dispose non-hazardous waste. Assume $19.50/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Swale
Description: Install a north-south trending unlined storm drainage channel in LFU-1 drainage area (assume 380 ft).

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LFU-1 DRAINAGE SWALE	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $18,841

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LFU-1 DRAINAGE SWALE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LFU-1 DRAINAGE SWALE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: North-south trending unlined storm drainage channel will be constructed in LFU-1 drainage area (assume 380 ft).

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage improvements. 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 Excavation
Description: Excavate LFU-2 waste cells. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean fill. Revegetate surface. Load and haul Landfill Unit 2 soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Include radiological work contingency (15%).

Approach: In Situ
Start Date: March, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $2,619,614

Technologies:

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		2,118,814	$
Percentage	15.9	15.9	%
Dollar Amount		336,891	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		30,528	CY
Depth		13	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	10	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	124	124	EA
Number of Composites Submitted to Lab	31	31	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate waste cells in Landfill Unit 2.

Excavation to be backfilled and compacted with clean fill.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		42,740	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul Landfill Unit 2 TEV to stockpiling areas.
Assume stockpile area is to the east of LFU-2, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Landfill Unit 2 excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 VOC "Hot Spot" Excavation
Description: Excavate LFU-2 VOC "Hot Spot." Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $253,312

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,210	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	52	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	9	9	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate the LFU-2 VOC "Hot Spot" to a depth of 20 feet bgs.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,693	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul LFU-2 VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		200,473	$
Percentage	19.7	19.7	%
Dollar Amount		39,493	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: WBH Cap
Description: Install multiple-layer cap over WBH CAMU. Dispose non-PTW from ST and HFSDA. Grade cap and surrounding area to promote drainage. Survey boundaries of completed cap. 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: July, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
GRADE AROUND WBH CAP TO PROMOTE DRAINAGE	Yes	5	95
Professional Labor Management	Yes	80	20
Capping	Yes	20	80
LAND SURVEY OF CAP	Yes	5	95
Off-site Transportation and Waste Disposal	Yes	5	95

Total Marked-up Cost: $338,380

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **GRADE AROUND WBH CAP TO PROMOTE DRAINAGE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		GRADE AROUND WBH CAP TO PROMOTE DRAINAGE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: Grade area around WBH to promote drainage into constructed storm drains inlets.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		273,812	$
Percentage	19.6	19.6	%
Dollar Amount		53,667	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Capping (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Cap		RCRA C (Hazardous Waste) Cap	n/a
Acres		0.57	AC
Length		223	FT
Width		111	FT
Safety Level		D	n/a
General			
Secondary Parameters			
Side Slope of Cap	3	3	n/a
Horizontal Projection of Side Slope	28	28	FT
Horizontal Projection of Top Slope	28	28	FT
RCRA C			
Secondary Parameters			
Surface Layer Type	Vegetated Layer	Vegetated Layer	n/a
Surface Layer Thickness	6	6	IN
Surface Layer Borrow Source	Off-site	Off-site	n/a
Protection Layer Thickness	24	24	IN
Protection Layer Borrow Source	Off-site	Off-site	n/a
Drainage Layer Type	Geocomposite	Geocomposite	n/a
Composite Barrier: Geomembrane Type	40 Mil HDPE	40 Mil HDPE	n/a
Composite Barrier: Compacted Clay Layer Type	Geosynthetic Clay Liner	Geosynthetic Clay Liner	n/a
Foundation Layer Thickness	12	12	IN
Foundation Layer Borrow Source	Off-site	Off-site	n/a
Gas Vent System		No	n/a

Comments: Install mulitple-layer cap over WBH CAMU area (accout for area beyond waste cell boundaries required for side slope). Cap will extend into LFU2 to allow for the creation of a waste cell to accomodate non-PTW from ST and HFSDA.
Additional cap area assumed based on cap extending 10.5 feet beyond WBH perimeter due to 3.5 foot thick cap and 3:1 maximum slope.
Total capped area = 0.57 acres

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF CAP**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF CAP	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew would have to come out during four different phases of the cap construction (initial boundaries, after foudation soil layer is added, after the geosynthetic, geomembrane, and geocomposite layers are added, and after the vegetatitve cover is added). Licensed surveyor report. 3 man survey crew - 4 x 1/2 day. Licensed surveyor report.

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to be drummed	n/a
Volume of Bulk Solid Waste		10	CY
Stabilization		None	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		5	MI
Safety Level		D	n/a
Containers			
Secondary Parameters			
Type of Container	Intermodal (20 CY)	Intermodal (20 CY)	n/a
Fill Capacity Factor per Container	0.9	0.9	n/a
Quantity of Containers	1	1	EA

Comments: Transport, dispose waste generated during WBH cap construction. Assume 10 CY of non-hazardous material is generated and disposed at local landfill.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Install New GW Monitoring Wells
Description: Install, develop, and survey new groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: August, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
WELL DEVELOPMENT	Yes	40	60
Groundwater Monitoring Well	Yes	40	60
Residual Waste Management	Yes	80	20
LAND SURVEY	Yes	5	95
DDC WELL AND PIEZOMETER INSTALLATION	Yes	100	0

Total Marked-up Cost: $297,551

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		121,933	$
Percentage	19.9	5	%
Dollar Amount		6,097	$

Comments:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **WELL DEVELOPMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WELL DEVELOPMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.01	n/a
Safety Level		D	n/a

Comments: Rent equipment for well develoment for 1 week. One equipment operator and one supervising engineer/geologist.

Estimate Documentation Report

Technology Name: **Groundwater Monitoring Well (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Aquifers		Two	n/a
Include Guard Posts		No	n/a
Depth to Groundwater to Aquifer One		50	FT
Number of Wells to Aquifer One		9	EA
Depth to Groundwater to Aquifer Two		50	FT
Number of Wells to Aquifer Two		1	EA
Safety Level		D	n/a
Aquifer One			
Required Parameters			
Aquifer One: Average Well Depth		70	LF
Aquifer One: Formation Type		Unconsolidated	n/a
Aquifer One: Drilling Method		Hollow Stem	n/a
Aquifer One: Well Diameter		2 Inch	n/a
Aquifer One: Well Construction Material		PVC Schedule 80	n/a
Aquifer One: Split Spoon Sample Collection		Yes	n/a
Aquifer One: Average Number of Soil Samples per Well		0	EA
Aquifer One: Soil Analytical Template		None	n/a
Aquifer One: Safety Level		D	n/a
Aquifer Two			
Required Parameters			
Aquifer Two: Average Well Depth		105	LF
Aquifer Two: Formation Type		Unconsolidated	n/a
Aquifer Two: Drilling Method		Hollow Stem	n/a
Aquifer Two: Well Diameter		4 Inch	n/a
Aquifer Two: Well Construction Material		PVC Schedule 80	n/a
Aquifer Two: Split Spoon Sample Collection		Yes	n/a
Aquifer Two: Average Number of Soil Samples per Well		0	EA
Aquifer Two: Soil Analytical Template		None	n/a
Aquifer Two: Safety Level		D	n/a

Comments: Install new wells according to Table 5-3.

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		10	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey newly installed groundwater monitoring wells. Registered surveyor report. 0.5 day

Technology Name: **User Defined Estimate (# 4)**
User Name: **DDC WELL AND PIEZOMETER INSTALLATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DDC WELL AND PIEZOMETER INSTALLATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.90	n/a
Safety Level		D	n/a

Comments: Installation cost of 3 density-driven convection wells and 3 sets of nested piezometers (each nest containing 3 piezometers) as replacements for those decommissioned in the ET North.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building Reconstruction
Description: Replace buildings H-253, H-290, H-292, and H-293 with three new buildings during site restoration. The two Geriatrics buildings will be reconstructed. The LFU-3 storage building and Cobalt-60 Annex will replaced with one building equal in area to the two combined. The X buildings will not be replaced.

Approach: Ex Situ
Start Date: December, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0

Total Marked-up Cost: $423,616

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-292 (Geriatrics Building No. 1)

Technology Name: **User Defined Estimate (# 2)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-293 (Geriatrics Building No. 2)

Technology Name: **User Defined Estimate (# 3)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace buildings H-253 and H-290 with one builing equivalen in square footage.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 4)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Add 20% contingency to cost of building reconstruction.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Groundwater and Storm Water Monitoring
Description: Groundwater monitoring and storm water monitoring for lifetime of alternative until cleanup objectives are met. Sample collection, analysis, data validation, data import and monitoring reports.

Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
MONITORING	Yes	100	0

Total Marked-up Cost: $3,775,150

Technologies:

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		MONITORING	n/a
Groundwater		Yes	n/a
Surface Soil		No	n/a
Surface Water		Yes	n/a
Subsurface Soil		No	n/a
Sediment		No	n/a
Soil Gas		No	n/a
Air		No	n/a
Site Distance (One-way)		70	MI
Safety Level		D	n/a
Groundwater			
Required Parameters			
Average Sample Depth		50	FT
Samples per Event (First Year)		16	n/a
Samples per Event (Out Years)		16	n/a
Number of Events (First Year)		4	n/a
Number of Events (Out Years)		1	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	System Water - Low Level Radioactive	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Sampling Method	Existing Wells - Low Flow Pump	Existing Wells - Low Flow Pump	n/a
Number of Wells/Day	8	8	EA
Contain Purge Water	Yes	Yes	n/a
Surface Water			
Required Parameters			
Average Sample Depth		0	FT

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
Surface Water			
Required Parameters			
Samples per Event (First Year)		3	n/a
Samples per Event (Out Years)		3	n/a
Number of Events (First Year)		2	n/a
Number of Events (Out Years)		2	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	None	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Number of Samples/Day	8	8	EA
QA/QC			
Secondary Parameters			
Split Samples	1: 10	1: 10	EA
Field Duplicate Samples	1: 10	1: 10	EA
Rinse Blanks (per Round)	1	1	EA
Trip Blanks (per Day)	1	1	EA
Matrix Spikes/Matrix Spike Duplicates	1: 20	1: 20	EA
Data Management			
Secondary Parameters			
Monitoring Plan	Standard	Standard	n/a
Lab Data Review	Stage 2b	Stage 2b	n/a
Submit Data Electronically	Yes	Yes	n/a
Monitoring Reports	Abbreviated	Abbreviated	n/a

Comments: Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the capped areas. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, Semivolatile organic compounds (1,4-dioxane by single ion monitoring) Cam 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. Includes data validation, electronic data import, data management and monitoring reports.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M Drainage System
Description: Annual O&M of constructed drainage channels.

Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	No	0	0

Total Marked-up Cost: $1,000

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	n/a
WBS Type		HTRW	n/a
Selected WBS		342.05.08	n/a
Safety Level		D	n/a

Comments: Present value cost for annual O&M of drainage channels. Assume $1,000/year in maintenance for lifetime of alternative. (Cost is expressed as annual cost only)

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M of Caps
Description: Operations and maintenance of WBH multiple-layer capped area. Assume top layer is vegetated.

Start Date: August, 2012
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Operations and Maintenance	Yes	40	60

Total Marked-up Cost: $369,850

Technologies:

Technology Name: **Operations and Maintenance**

Description	*Default*	*Value*	*UOM*
Labor			
Secondary Parameters			
Operations Labor: Type	Exclude from Estimate	Minimum	n/a
Professional Labor: Type	Exclude from Estimate	Minimum	n/a

Comments: Inspect, survey and repair WBH for lifetime of cap. Assumes some erosion and settlement, but no large scale failure.

Estimate Documentation Report

Technology Name: **Capping (# 1) - (O&M Parameters)**

Description	*Default*	*Value*	*UOM*
O&M Parameters			
Type of Cap		RCRA C (Hazardous Waste) Cap	n/a
Acres		0.57	AC
Surface Layer Type		Vegetated Layer	n/a

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Five-Year Reviews
Description: Five-Year Reviews for all technologies and controls implemented.

Start Date: March, 2015
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Five-Year Review	Yes	100	0

Total Marked-up Cost: $159,250

Technologies:

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Site Complexity		Low	n/a
Document Review		Yes	n/a
Interviews		Yes	n/a
Site Inspection		Yes	n/a
Report		Yes	n/a
Travel		No	n/a
Rebound Study		No	n/a
Start Date		March-2015	n/a
No. Reviews		6	EA
Document Review			
Required Parameters			
5-Year Review Check List		Yes	n/a
Record of Decision		Yes	n/a
Remedial Action Design & Construction		Yes	n/a
Close-Out Report		Yes	n/a
Operations & Maintenance Manuals & Reports		Yes	n/a
Consent Decree or Settlement Records		Yes	n/a
Groundwater Monitoring & Reports		Yes	n/a
Remedial Action Required		Yes	n/a
Previous 5-Year Review Reports		Yes	n/a
Interviews			
Required Parameters			
Current and Previous Staff Management		Yes	n/a
Community Groups		Yes	n/a
State Contacts		Yes	n/a
Local Government Contacts		Yes	n/a
Operations & Maintenance Contractors		Yes	n/a
PRPs		Yes	n/a
Remedial Design Consultant		Yes	n/a
Site Inspection			
Required Parameters			

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
Site Inspection			
Required Parameters			
General Site Inspection		Yes	n/a
Containment System Inspection		Yes	n/a
Monitoring Systems Inspection		Yes	n/a
Treatment Systems Inspection		Yes	n/a
Regulatory Compliance		Yes	n/a
Site Visit Documentation (Photos, Diagrams, etc.)		Yes	n/a
Report			
Required Parameters			
Introduction		Yes	n/a
Remedial Objectives		Yes	n/a
ARARs Review		Yes	n/a
Summary of Site Visit		Yes	n/a
Areas of Non Compliance		Yes	n/a
Technology Recommendations		Yes	n/a
Statement of Protectiveness		Yes	n/a
Next Review		Yes	n/a
Implementation Requirements		Yes	n/a

Comments: Inspect landfill areas for performance issues such as erosion or excessive settlement. Review and update all documents associated with compliance, performance, land use controls, and monitoring results. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews every five years for the lifetime of the alternative.

ATTACHMENT F-9c

ALTERNATIVE SW-9 ASSEMBLY LEVEL REPORT

See file in Appendix F Folder titled 'Attachment_F-9c_SW-9_AssemblyLevelReport.xlsx'

ATTACHMENT F-10a

ALTERNATIVE SW-10 COST ASSUMPTIONS

ALTERNATIVE SW-10 COST ASSUMPTIONS

Attachment F-10a-1. Alternative SW-10 Description

Attachment F-10a-2. Planning and Oversight

Attachment F-10a-3. Biological Survey and Elderberry Shrub Cluster Relocation

Attachment F-10a-4. Decontamination Facilities

Attachment F-10a-5. Building Decommissioning and Demolition, Building Sampling and Analysis

Attachment F-10a-6. Building Decommissioning and Demolition, Building Demolition and Reconstruction

Attachment F-10a-7. Groundwater Monitoring Well Decommissioning

Attachment F-10a-8. Clearing and Grubbing

Attachment F-10a-9. Demolish LFU-3 Drainage Channel

Attachment F-10a-10. Excavation of Eastern Trenches

Attachment F-10a-11. Excavation of ET VOC “Hot Spot”

Attachment F-10a-12. Excavation of LFU-1

Attachment F-10a-13. Excavation of LFU-2

Attachment F-10a-14. Excavation of LFU-2 VOC “Hot Spot”

Attachment F-10a-15. Excavation of LFU-3

Attachment F-10a-16. Excavation of ST and HFSDA

Attachment F-10a-17. Excavation of WBH

Attachment F-10a-18. Materials Management

Attachment F-10a-19. Off-Site Transportation and Disposal

Attachment F-10a-20. Install New Groundwater Monitoring Wells

Attachment F-10a-21. Storm Drainage Controls

Attachment F-10a-22. O&M: Institutional Controls

Attachment F-10a-23. O&M: Groundwater and Storm Water Monitoring

Attachment F-10a-24. O&M of Storm Water Drainage Infrastructure

Attachment F-10a-25. Periodic Costs: Five Year Reviews

Alternative SW-10. Excavate and Dispose of Waste Off-Site, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring - Please see Section 5 of the FS - Volume 1 for a description of this alternative.

Alternative SW-10 Components Listed:

- Planning and oversight
- Biological Survey
- Elderberry Shrub Cluster Relocation
- Decontamination Facilities
- Building Decommissioning and Demolition
  - Building Sampling
  - Building Demolition and Reconstruction
- Groundwater Well Decommissioning
- Clearing and Grubbing
- Demolish/Backfill LFU-3 Drainage Channels
- ET Excavation - ET North and ET South
- ET VOC "Hot Spot," East and West Excavation
- LFU-1 Excavation - LFU-1 Drainage Area and LFU-1 Non-Drainage Area
- LFU-2 Excavation - LFU-2 Waste Cells
- LFU-2 VOC "Hot Spot" Excavation
- LFU-3 Excavation - LFU-3 Waste Cells
- Excavate ST and HFSDA
- WBH Excavation - WBH Shallow, WBH Intermediate, WBH Deep, and WBH Deep (south)
- Materials Management
- Off-Site Transportation and Disposal
- Install New Groundwater Wells
- Storm Water Collection and Conveyance System
  - Installation of vegetated swale along eastern edge of LFU-1
  - Redirect drainage ditch south along perimeter of LFU-3
  - Reconstruct north-south drainage channel
- Operations and Maintenance (O&M): Institutional Controls
- O&M: Groundwater and Storm Water Monitoring
- O&M of Storm Water Drainage Infrastructure
- Periodic Cost: Five Year Reviews

Planning and Oversight

Work planning, Health and Safety, Construction Quality Assurance/Quality Control Program, Construction Site Environmental Controls, Materials Management Plan (Table 5-1)

Costs for most planning and oversight are inclduded in RACER's "Professional Labor Management" cost sub-component and in professional labor cost assemblies.
These planning and oversight activities include:

Preparation and submittal of Contract-Required Deliverables
Preparation and submittal of project-specific planning documents (Work Plan, HASP, QAPP, materials management plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Sampling and Construction Quality Control Test Results
Health & Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Costs are estimated as a percentage of the calculated marked-up cost for a given remedial action component through "Professional Labor Management," or through professional labor assemblies included in the estimate for the remedial action cost component.

"Professional Labor Management" includes the costs of typical professional support activities associated with construction including preparation of site-specific construction activities, incidental permit acquisition, and contract-required deliverables. It also includes typical site-specific professional support activities associated with remedial action including evaluation of sampling and analysis data, comparison of results with project goals, coordination of field activities, and documentation and reporting of field activities. Each cost component has planning and oversight costs associated with it; where professional labor management is not specifically included as a cost sub-component, it is assumed that such cost estimates contain professional labor hours bundled with the cost for implementation of that cost component.

Biological Survey

Conduct a biological survey assessing selected plant, insect and animal species abundance, assess biotic diversity, and survey endangered/critical species' habitat.

Present findings in an biological survey report.

Elderberry Shrub Cluster Relocation

Elderberry shrub clusters located within areas potentially impacted by remediation will be relocated to the Russell Ranch Mitigation Area, as specified in the UC Davis Long Range Development Plan EIR Mitigation Measure 4.4-6(b).

Assume cost is $270,000 based on previous relocations.

Attachment F-10a-4. Decontamination Facilities - Cost Estimates, UC Davis LEHR/OCL

Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 72 weeks.

Equipment Decontamination Operation Length	72	weeks
Average crew size	10	
Shifts	1	per day

Prior to implementation of the alternatives, nine Site buildings will be demolished and disposed off-Site. It is assumed the buildings are contaminated with asbestos, lead, and PCBs. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated.
Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. Assume 1 sample per 300 ft2 of building surfaces. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals.

Total Building Surface Area	43,287	ft2
Number of samples	141	(see backup work below)
Sampling rate	75	samples/day
Crew Size	3	2 radiation technicians + 1 Health and Safety Officer

Analytical:	TCLP (RCRA) (EPA 1311)	H-292 and H-293 will also include:
	Testing, TAL metals (6010/7000s)	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total
	Pesticides/PCBs (SW 3550B/SW 8081/8082)	Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic
	Asbestos in Bulk Solids/Soils (Identification by PLM)	Testing, rad analytical vegetation/sediment/soil, gross alpha, total gas flow proportional counting

Two (2) Geriatrics Buildings (H-292 and H-293)

Length (ft)	Width (ft)	Area (ft^2)	Height (ft)	Pitch of Roof (degrees)		Building Surface Area (ft2)	Volume of component (ft3)	volume of component (CY)	# samples
					walls	3,182	265	10	10
100	53	5,285	10	5	roof	5,305	442	16	6
					floor	5,285	5,285	196	6
					other building materials (assume 5% of building structure)	---	300	11	9
					Total	13,772	6,292	233	31

Five (5) Vacant Animal Housing Buildings (H-231,-232,-234,-236,-237)

Length (ft)	Width (ft)	Area (ft^2)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft2)	Volume of component (ft3)	volume of component (CY)	# samples
					walls	917	382	14	4
25	20	500	10	5	roof	502	42	2	1
					floor	500	500	19	1
					other building materials (assume 5% of building structure)		46	2	4
					Total	1,919	970	36	10

Storage Building at West Side of Landfill No. 3 (H-253)

Length (ft)	Width (ft)	Area (ft^2)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft2)	Volume of component (ft3)	volume of component (CY)	# samples
					walls	1,439	120	4	6
40	30	1,200	10	5	roof	1,205	100	4	4
					floor	1,200	1,200	44	4
					other building materials (assume 5% of building structure)		71	3	5
					Total	3,844	1,491	55	19

Co-60 Annex (H-290)

Length (ft)	Width (ft)	Area (ft^2)	Height (ft)	Pitch of Roof (degrees)		Building surface area (ft2)	Volume of component (ft3)	volume of component (CY)	# samples
					walls	1,039	87	3	4
30	21	630	10	5	roof	632	53	2	1
					floor	630	630	23	1
					other building materials (assume 5% of building structure)		38	1	4
					Total	2,302	808	30	10
					Grand Total (all buildings)	43,287	19,734	731	141

Demolish and dispose buildings that must be removed to implement remedial action. Assume buildings are contaminated with asbestos, lead, and PCBs. Demolition waste will be sent off-Site for disposal.

Building

1 Demolish, dispose Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste. Assume $15/CY for non-hazardous demolition waste.

Building Area	5,285	ft2	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

2 Demolish, dispose Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste. Assume $15/CY for non-hazardous demolition waste.

Building Area	5,285	ft2	
Type of Building	steel		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0044	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	266	CY	
Volume Hazardous	14	CY	
Safety Level	Level D		

3 Demolish, dispose Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste. Assume $15/CY for non-hazardous demolition waste.

Building Area	500	ft2	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

4 Demolish, dispose Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste. Assume $15/CY for non-hazardous demolition waste.

Building Area	500	ft2	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

5 Demolish, dispose Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste. Assume $15/CY for non-hazardous demolition waste.

Building Area	500	ft2	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

6 Demolish, dispose Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste. Assume $15/CY for non-hazardous demolition waste.

Building Area	500	ft2
Type of Building	concrete	
Number of stories	1	

Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

7 Demolish, dispose Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste. Assume $15/CY for non-hazardous demolition waste.

Building Area	500	ft2	
Type of Building	concrete		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0072	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	42	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

8 Demolish, dispose storage building near northwest corner of Landfill No. 3 (H-253). Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste. Assume $15/CY for non-hazardous demolition waste.

Building Area	1,200	ft2	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	64	CY	
Volume Hazardous	3	CY	
Safety Level	Level D		

9 Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for demolition waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste. Assume $15/CY for non-hazardous demolition waste.

Building Area	630	ft2	
Type of Building	wood		
Number of stories	1		
Percent Hazardous Material	5%		
Height	12	ft	
Demolition Factor	0.0046	CY/CF	waste per cubic foot volume of building
Volume Non-Hazardous	33	CY	
Volume Hazardous	2	CY	
Safety Level	Level D		

Note: A new building will be constructed to replace buildings H-253 and H-290. The replacement is assumed to be 1,830 square feet.

Total Volume of Non-Hazardous Building Demolition Waste to Dispose of Off-Site
838 CY

Total Volume of Hazardous Building Demolition Waste to Dispose of Off-Site
45 CY

Building Reconstruction Costs

Three warehouse buildings will be constructed. Two will be replacements for the Geriatrics buildings, H-292 and H-293, the third is to replace buildings, H-253 and H-290.

Cost estimates are based on phone conversation with representative from Allied Steel (12/20/2010) and estimates from Rex Moore Electrical Contractors (12/22/2010) and J.W. McClenahan Company plumbing contractors (1/3/2011). Estimates include engineering, design, and construction. 20% contingency to be added to account for additional cost elements.

1,830 SF warehouse:

Building design and construction (with concrete foundation): $30,000	Dimensions: 35’ x 55’ x 10’	Distance to potable water main = 50 feet
Electrical: $16,031	1 restroom (toilet + sink)	Distance to sanitary sewer = 200 feet
Plumbing: $18,000	1 industrial sink	Distance to electrical distribution = 100 feet
Estimated Cost = $34.99/SF		

5,285 SF warehouse:

Building design and construction (with concrete foundation): $70,000	Dimensions: 53’ x 100’ x 10’	Distance to potable water main = 50 feet
Electrical: $27,214	1 restroom (toilet + sink)	Distance to gas = 100 feet
Plumbing: $47,250	2 industrial sinks	Distance to sanitary sewer = 300 feet
Estimated Cost = $27.34/SF	natural gas connection	

Decommission the following wells (Table 5-3):

Well	Total Boring Depth (ft bgs)	Well Diameter (inches)	Well Screen Type
DDC-1*	85.5	15	PVC
DDC-2*	80	15	PVC
DDC-3*	80	15	PVC
TP-1*	80	15	PVC
TP-2*	79	12.25	PVC
TP-3*	80.5	12.25	PVC
TP-4*	80.5	12.25	PVC
TP-5*	80	12.25	PVC
UCD1-008	56	2	PVC
UCD1-009	51.5	2	PVC
UCD1-012	65	4	PVC
UCD1-013	65	4	PVC
UCD1-050	69.5	4	Stainless Steel
UCD1-051	70	4	Stainless Steel
UCD2-014	86	4	PVC

* If nested well, value is the borehole diameter.

Attachment F-10a-8. Clearing and Grubbing - Cost Estimates, UC Davis LEHR/OCL

Clear and Grub	Clear all trees and vegetation within footprint of excavation/cap. Used current satellite photo and photographs from recent field activities to estimate amount of vegetation to clear. Assumed all removed material will be stored on-Site for re-use.	
LFU-1	Disposal	on-site, chipped
	ACRES	2.4 AC
	FLORA DENSITY	light; 5 trees per acre
LFU-2/ET/WBH	Disposal	on-site, chipped
	ACRES	3.5 AC
	FLORA DENSITY	light; 15 trees per acre
LFU-3	Disposal	on-site, chipped
	ACRES	1.0 AC
	FLORA DENSITY	light; 10 trees per acre
ST/HFSDA	Add to LFU-2/ET/WBH clearing and grubbing cost element	
	Disposal	on-site, chipped
	ACRES	0.4 AC
	FLORA DENSITY	light; 15 trees per acre

Attachment F-10a-9. Demolish LFU-3 Drainage Channel - Cost Estimates, UC Davis LEHR/OCL

Description:

Demolish the LFU-3 N-S concrete lined drainage channel. The drainage area will be re-constructed in its original location post-remediation, but will have a vegetated lining instead of concrete.
The E-W drainage ditch will be destroyed/backfilled during remediation. It will be re-routed south of the LFU-3 area after remediation.

Major Assumptions:

Estimate the volume of concrete to be removed in demolition of Landfill Unit No. 3 N-S drainage channel:

Length (total)	270	ft	
Length (portion to be demolished)	270	ft	
Top Width of channel	30	ft	
Bottom Width of channel	16	ft	
Depth	7	ft	
Thickness of concrete	0.2	ft	
Length of side wall	9.9	ft	
Volume of channel concrete to remove	1,626	ft3	
	60	CY	convert to CY

Estimated backfill for the current E-W channel in the footprint of the proposed cap:

Length	100	ft	
Top Width of channel	9	ft	
Bottom Width of channel	3	ft	
Depth	3	ft	
Volume to backfill:	2,700	ft3	
	100	CY	
	140	**CY**	**bulk factor applied**

Excavate ET North and ET South to 8 feet bgs.
Dispose of excavated material off-Site.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET North

	Volume	1,171	BCY
	Avg. Depth	8	FT
	Source of backfill	25 mile distance off-Site	
	Number of confirmation samples	1 per 625 ft2 (25 ft x 25 ft grid) (default)	
	Number of composites	default	
	Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
		Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
		Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
		Testing, purgeable organics (624, 8260)	138.95 $/sample
		Testing, semi-volatile organics (625, 8270)	465.84 $/sample
		Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
		Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
		Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
	Turnaround Time	Standard 21 days	
	QC Level	Stage 1	
	Off-Site Backfill Required	1,639	LCY
	Safety Level	Level C	

Excavate ET South

	Volume	4,799	BCY
	Avg. Depth	8.0	FT
	Source of backfill	25 mile distance off-Site	
	Number of confirmation samples	1 per 625 ft2 (25 ft x 25 ft grid) (default)	
	Number of composites	default	
	Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
		Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
		Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
		Testing, purgeable organics (624, 8260)	138.95 $/sample
		Testing, semi-volatile organics (625, 8270)	465.84 $/sample
		Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
		Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
		Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
	Turnaround Time	Standard 21 days	
	QC Level	Stage 1	
	Off-Site Backfill Required	6,718	LCY
	Safety Level	Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety level C.

Load and Haul

Volume	8,358	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-10a-11. Excavation of ET VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate ET VOC "Hot Spot," east and west to depth of 20 feet bgs.
Dispose of excavated material off-Site. Backfill and compact with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate ET VOC "Hot Spot," East

Volume		713 BCY
Avg. Depth		20 FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft2 (25 ft x 25 ft grid) (default)	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		998 LCY
Safety Level		Level C

Excavate ET VOC "Hot Spot," West

Volume		492 BCY
Avg. Depth		20 FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft2 (25 ft x 25 ft grid) (default)	
Analytical	Testing, TAL metals (6010/7000s)	283.50 $/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81 $/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81 $/sample
	Testing, purgeable organics (624, 8260)	138.95 $/sample
	Testing, semi-volatile organics (625, 8270)	465.84 $/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99 $/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65 $/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59 $/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Percent to be used as backfill		0 %
Off-Site Backfill Required		689 LCY
Safety Level		Level C

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,686 LCY
One Way Haul Distance	500 FT

Land Survey of Excavation

Survey boundaries of ET VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-10a-12. Excavation of LFU-1 - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-1 Drainage Area and Non-Drainage Area to ten feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-1 Non-Drainage Area

Volume	25,614	BCY
Avg. Depth	10	FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft2 (25 ft x 25 ft grid) (default)	
Analytical		
Testing, TAL metals (6010/7000s)	283.50	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
Testing, purgeable organics (624, 8260)	138.95	$/sample
Testing, semi-volatile organics (625, 8270)	465.84	$/sample
Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta total	70.65	$/sample
Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Off-Site Backfill Required	35,860	LCY
Safety Level	Level D	

Excavate LFU-1 Drainage Area

Volume	7,215	BCY
Avg. Depth	10	FT
Source of backfill	25 mile distance off-Site	
Number of confirmation samples	1 per 625 ft2 (25 ft x 25 ft grid) (default)	
Analytical		
Testing, TAL metals (6010/7000s)	283.50	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
Testing, purgeable organics (624, 8260)	138.95	$/sample
Testing, semi-volatile organics (625, 8270)	465.84	$/sample
Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta total	70.65	$/sample
Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days	
QC Level	Stage 1	
Off-Site Backfill Required	35,860	LCY
Safety Level	Level D	

Load and Haul

Volume	45,960	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Land Survey of Excavation

Survey boundaries of Landfill Unit No. 1 excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-10a-13. Excavation of LFU-2 - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-2 Waste Cells to thirteen feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-2 Waste Cells:

Excavation includes LFU-2 VOC "Hot Spot"			
Volume		30,528	BCY
Avg. Depth		13	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft2 (25 ft x 25 ft grid) (default)		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Off-Site Backfill Required		42,740	LCY
Safety Level		Level D	

Load and Haul

Load and haul Landfill Unit No. 2 soil and waste to stockpiling areas. Assume stockpile area is to the east of LFU-2, assume 500 feet transport distance.

Excavated Volume	42,740	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Land Survey of Excavation

Survey boundaries of Landfill Unit No. 2 excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency

radiological work	15	%

Attachment F-10a-14. Excavation of LFU-2 VOC "Hot Spot" - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-2 VOC "Hot Spot" to depth of 20 feet bgs.
Excavated material disposed off-Site. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.
Level C safety assumed for excavation due to potential VOC impacted soil.

Excavate LFU-2 VOC "Hot Spot"

Volume		1,210	BCY
Avg. Depth		20	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	1 per 625 ft2 (25 ft x 25 ft grid) (default)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill (On-Site)		0	%
Off-Site Backfill Required		1,693	LCY
Safety Level		Level C	

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Load and Haul

Volume	1,693	LCY
One Way Haul Distance	500	FT

Land Survey of Excavation

Survey boundaries of LFU-2 VOC "Hot Spot" excavation. 3 man survey crew - One half-day. Licensed surveyor report.

Contingency radiological work 15 %

Attachment F-10a-15. Excavation of LFU-3 - Cost Estimates, UC Davis LEHR/OCL

Excavate LFU-3 Waste Cells to ten feet bgs. Backfill with clean fill.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate LFU-3 Waste Cells:

Volume		9,920	BCY
Avg. Depth		10	FT
Source of backfill	25 mile distance off-Site	13,889	LCY
Number of confirmation samples	1 per 625 ft2 (25 ft x 25 ft grid) (default)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		13,889	LCY
Safety Level		Level D	

Load and Haul

Volume	13,889	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety Level C.

Land Survey of Excavation

Survey boundaries of excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency

radiological work	15	%

Attachment F-10a-16. Excavation of ST and HFSDA - Cost Estimates, UC Davis LEHR/OCL

Excavate the ST and HFSDA. Backfill the excavations with clean fill.

Dispose of excavated material off-Site.
Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate ST

Volume		1,562	BCY
Avg. Depth		6	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	default, 1 per 625 ft2 (25 ft x 25 ft grid)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		2,186	LCY
Safety Level		Level D	

Excavate HFSDA

Volume		461	BCY
Avg. Depth		6	FT
Source of backfill	25 mile distance off-Site		
Number of confirmation samples	default, 1 per 625 ft2 (25 ft x 25 ft grid)		
Number of composites	default		
Analytical	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/8240	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritium	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		
Percent to be used as backfill		0	%
Off-Site Backfill Required		646	LCY
Safety Level		Level D	

Load and Haul

Load and haul ST and HFSDA soil and waste to stockpiling areas. Assume stockpile area is to the north of ST, assume 500 feet transport distance.

Excavated volume	2,832	LCY
One Way Haul Distance	500	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring. Safety level C.

Land Survey of Excavation

Survey boundaries of ST and HFSDA excavation. 3 man survey crew - Two half-days. Licensed surveyor report.

Contingency

radiological work	15	%

Attachment F-10a-17. Excavation of WBH, Cost Estimates, UC Davis LEHR/OCL

Excavate Waste Burial Holes subareas to depths specified below. Backfill with clean fill.

Cost estimate includes cost of support activities including ambient air monitoring and dust control.

Excavate WBH:

WBH Shallow			
Volume		3,557	BCY
Avg. Depth		10	FT
Source of backfill	off site; 10 miles		
Number of confirmation samples	default, 1 per 625 ft2 (25 ft x 25 ft grid)		
Percent to be used as backfill		0	%
Off-Site Backfill Required		4,980	LCY
Safety Level		Level D	
WBH Intermediate			
Volume		669	BCY
Avg. Depth		5	FT
Source of backfill	off site; 10 miles		
Number of confirmation samples	default, 1 per 625 ft2 (25 ft x 25 ft grid)		
Percent to be used as backfill		0	%
Off-Site Backfill Required		937	LCY
Safety Level		Level D	
WBH Deep			
Volume		191	BCY
Avg. Depth		5	FT
Source of backfill	off site; 10 miles		
Number of confirmation samples	default, 1 per 625 ft2 (25 ft x 25 ft grid)		
Percent to be used as backfill		0	%
Off-Site Backfill Required		268	LCY
Safety Level		Level D	
WBH Deep (South)			
Volume		31	BCY
Avg. Depth		20	FT
Source of backfill	off site; 10 miles		
Number of confirmation samples	default, 1 per 625 ft2 (25 ft x 25 ft grid)		
Percent to be used as backfill		0	%
Off-Site Backfill Required		44	LCY
Safety Level		Level D	
Analytical	Applies to each WBH subarea.		
	Testing, TAL metals (6010/7000s)	283.50	$/sample
	Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	257.81	$/sample
	Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 815	305.81	$/sample
	Testing, purgeable organics (624, 8260)	138.95	$/sample
	Testing, semi-volatile organics (625, 8270)	465.84	$/sample
	Testing, non-rad lab tests, tentative id of compounds GC/MS 30/5040/824(	74.99	$/sample
	Testing, rad analytical vegetation/sediment/soil, gas flow proportional counting, gross beta-total	70.65	$/sample
	Testing, rad analytical vegetation/sediment/soil, liquid scintillation, tritiu	105.59	$/sample
Turnaround Time	Standard 21 days		
QC Level	Stage 1		

Load and Haul

Load and haul excavated WBH material to stockpiling areas. Assume stockpile area is to the northeast of LFU-2, assume 700 feet transport distance.

Excavated Volume	6,228	LCY
One Way Haul Distance	700	FT

Excavated Material Monitoring

Monitor buckets of excavated material with Geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Land Survey of Excavation

Survey boundaries of WBH excavation. 3 man survey crew - 4 half-days. Licensed surveyor report.

Contingency

radiological work	15	%

Materials management includes activities related to the management of excavated soil and solid waste (i.e., stockpiling, sifting/sorting, waste characterization, and staging prior to final disposal).

Bulk Material Storage

Accommodate total excavated volume (TEV) across all subareas to allow for sorting, waste characterization, and staging. Stockpile excavated material in bermed, covered storage area. Safety Level D.

TEV (from subareas excavated under this alternative)	123,386	LCY

Sifting of Excavated Material

Assume rate of sifting = 200 CY/day

Assume the use of similar equipment used under the MEC Sifting assembly. Material will be segregated into PTW, biological waste, and LTW waste streams.

Safety Level C.

Soil/solid waste volume (PTW, biological waste, and LTW waste streams):	86,186	LCY
Trommel Screener	11	month
Grizzly Shaker Unit	11	month
Conveyors,	2	unit
Refuse Bottom Hopper	2	unit
5'x16' Double tray Vibrating Screening Unit	2	unit
Two full-time equipment operators, oilers (per screening operation)	7,199	hrs

Loader for Staging Area

One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled material needs to be moved. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

950, 3.0 CY, Wheel Loader (active)	2,200	hours
950, 3.0 CY, Wheel Loader (standby)	2,200	hours
Bobcat with Backhoe	22	month
All Terrain Forklift (Monthly Rental)	22	month

Waste Characterization

Assume the included materials and analyses for waste characterization prior to final disposal of excavated materials. (ET PTW and ET VOC Hotspot excavated material) 1 sample per 300 CY.

Material to be characterized:	TEV from subareas excavated	
Total Volume	123,386	LCY
Sampling rate	1	sample/300 CY (or 1 sample per container)
Number of samples	412	
Analytical suite:		
Testing, TAL metals (6010/7000s)	257.73	$/sample
TCLP (RCRA) (EPA 1311), Soil Analysis	120.30	$/sample
Testing, soil & sediment analysis, BTEX/gasoline hydrocarbons mod EPA 8020 (PID/FIFD)	107.37	$/sample
Pesticides/PCBs (SW 3550B/SW 8081/8082), Soil Analysis	234.37	$/sample
Testing, soil & sediment analysis, chlorinated phenoxy acid herbicides EPA 8150	278.01	$/sample
Purgeable organics (624, 8260)	126.31	$/sample
Testing, semi-volatile organics, pkd. column (8250)	416.14	$/sample
Testing, paint filter liquids test (9095)	27.90	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, ignitibility (1010)	31.64	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, corrosivity (1110, NACE)	26.04	$/sample
Testing, RCRA evaluations, corrosivity, ignitability & reactivity, reactivity (cyanide/sulfide)	72.65	$/sample
Testing, rad analytical vegetation/sediment/soil, gamma spectroscopy, gamma isotopic	133.34	$/sample
Testing, rad analytical, additional services, characterization of any unknown rad sample (low level)	194.36	$/sample

Drum Staging

Drums for PTW laboratory waste (lab pack) disposal. Includes characterization of wastes in drums. Assume number of drums = volume of PTW in LCY divided by four. Safety Level C.

Total PTW	1,116	LCY
Bulk containers for PTW	41	30 CY containers
Number of drums	279	
Percentage Full	65	%
Temporary Storage Area	3,256	ft2
Overpacks	85 gal. steel salvage drum	
Waste characterization	1 sample per drum, liquid waste characterization template	

Attachment F-10a-19. Off-Site Transportation and Disposal - Cost Estimates, UC Davis LEHR/OCL

	LLRW (LCY)	**Mixed Waste** (LCY)	**RCRA Hazardous** (LCY)	**Non-RCRA Hazardous** (LCY)	**Non-Hazardous** (LCY)	**Building Hazardous** (LCY)	**Building Non Hazardous** (LCY)	**Drums/Lab Pack** (number of drums)
Distance to disposal facility	594 miles	594 miles	227 miles	227 miles	93 miles	227 miles	93 miles	594 miles
Volume*	44,829	2,164	49,124	7,843	19,426	45	838	
Volume for Incineration**	312	0	0	0	0	0	0	
Final Disposal Volumes	**44,517**	**2,164**	**49,124**	**7,843**	**19,426**	**45**	**838**	**279**

* See Table E-13 (Appendix E, FS - Volume 1).
** Biological waste only.

Attachment F-10a-20. Install New Groundwater Wells - Cost Estimates, UC Davis LEHR/OCL

Groundwater Well Installation - Nine HSU-1 groundwater monitoring wells and one HSU-2 groundwater monitoring well would be installed. The wells will have screen/sand pack intervals of seven feet or less to minimize their potential to act as vertical conduits for downward COC migration, and will be completed just below the bottom of the depth range of seasonal water table fluctuation. In addition, it is assumed that three density-driven convection (DDC) wells and three nested piezometers would be installed as replacements for those decommissioned in the ET North.

9 HSU-1 wells, 70 ft depth, 2" diameter, PVC Schedule 80
1 HSU-2 well, 105 ft depth, 4" diameter, PVC Schedule 80
3 DDC wells, 90 ft depth, 15" diameter borehole. Each DDC well assumed to include:
- Recirculating well: 90 ft depth, 4" diameter, PVC Schedule 80
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 30 ft depth
  - Intermediate: 52 ft depth
  - Deep: 76 ft depth
- Air Injection Tubing: 90 ft depth + 35 feet to blower, 1.25" diameter, PVC Schedule 80
- Vapor Return Line: 50 feet to discharge pipe, 2" diameter, PVC Schedule 80
- Acid Drip Line: 35 feet to acid storage, 0.75" diameter, PVC Schedule 80

3 Sets of Nested Piezometers, 80 ft depth, 15" diameter borehole. Each set of piezometers assumed to include:
- Piezometers (3): Depths below, 2" diameter, PVC Schedule 80
  - Shallow: 35 ft depth
  - Intermediate: 53 ft depth
  - Deep: 80 ft depth

Dispose drill cuttings as non-hazardous waste
Survey and develop completed wells

Attachment F-10a-21. Storm Drainage Controls - Cost Estimates, UC Davis LEHR/OCL

LFU-1 Storm Drainage

North-south trending vegetated swale will be constructed to east of capped and lined CAMU.

Lining:	soil/vegetation	
Length	400	feet
Erosion Controls - Geotextile	326	yd^2
Erosion Controls - Rip-rap	24	CY

LFU-3 N-S Drainage Channel

North-south trending concrete-lined drainage channel will be reconstructed to match original dimensions.

Length	270	ft
Top Width	30	ft
Bottom Width	16	ft
Depth	7	ft

Length of north-south drainage channel to reconstruct	270	ft
Lining	soil/vegetation	
Erosion Controls - Geotextile	652	yd^2
Erosion Controls - Rip-rap	64	CY

LFU-3 E-W Drainage Ditch

Re-route the east-west vegetated drainage ditch to the south of LFU-3. Install new culvert to discharge into north-south, concrete-lined drainage channel.

Lining:	soil/vegetation	
Length	260	ft
Top Width	15	ft
Depth	3	ft
Erosion Controls - Geotextile	212	yd^2
Erosion Controls - Rip-rap	16	CY

Survey :

Survey newly constructed drainage channels and detention basins. One half-day. Registered surveyor report.

Attachment F-10a-22. O&M: Institutional Controls, Cost Estimates, UC Davis LEHR/OCL

Perform initial survey to establish legal boundaries of Site.
Implement and maintain land use controls.
Document waste placement locations and prohibit site development or activities incompatible with designated land use.

		# meetings	# people	# days	airfare	mileage to meeting site
Planning Documents	LUC Assurance Plan	2	2	1	0	70
	LUC Implementation Plan	2	2	1	0	70
	Construction Permitting	1	1	1	0	70
	Geographic Information Systems/Overlay Maps	1	1	1	0	70
Implementation	Deed Notification	1	unit			
	Restrictive Covenants	1	unit			
	Access Control Signs	22	unit	Assume one sign every 150 feet around perimeter of land disposal units		
	Utility Notification Service	1	unit			
	GIS/Overlay maps	1	unit			
Monitoring and Enforcement						
	Duration of monitoring/enforcement	100	YRS (or lifetime of alternative)			
	Reports & Certifications	1	per year			
	Site Visits/Inspections	1	per year			
Survey:	5 days, licensed surveyors' report					

Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the land disposal units according to Table 5-3. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, semivolatile organic compounds (1,4-dioxane by single ion monitoring) CAM 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three designated storm water sampling locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. The groundwater and storm water monitoring period will continue throughout the lifetime of the alternative until Site cleanup goals are achieved.

Includes data validation, electronic data import, data management and monitoring reports.
16 wells to be included.

Attachment F-10a-24. O&M of Storm Water Drainage Infrastructure - Cost Estimates, UC Davis LEHR/OCL

Assume annual maintenance costs of $1,000/year for lifetime of drainage system.

Includes LFU-1 drainage swale and LFU-3 drainage channels

Attachment F-10a-25. Periodic Costs: Five Year Reviews, Cost Estimates, UC Davis LEHR/OCL

Review and update all documents associated with compliance, performance, land use controls. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews for period of 30 years

Document Review

Interviews	Current and Previous Staff Management
	Community Groups
	State Contacts
	Local Government Contacts
	Operations & Maintenance Contractors
	PRPs
	Remedial Design Consultant
Site Inspection	General Site Inspection
	Containment System Inspection
	Monitoring Systems Inspection
	Treatment Systems Inspection
	Regulatory Compliance
	Site Visit Documentation (Photos, Diagrams, etc.)
Report	

ATTACHMENT F-10b

ALTERNATIVE SW-10 ESTIMATE DOCUMENTATION REPORT

Estimate Documentation Report

System:

RACER Version: 10.3.0
Database Location: C:\Documents and Settings\gch\Application Data\AECOM\RACER 10.3\Racer.mdb

Folder:

Folder Name: Alternative SW-10

Project:

Project ID: FS_Cost
Project Name: Feasibility Study Cost Estimate
Project Category: Detailed Analysis of FS Alternatives

Location
State / Country: CALIFORNIA
City: SACRAMENTO

Location Modifier	Default	User
	1.203	1.203

Options
Database: Modified System
Cost Database Date: 2010
Report Option: Calendar

Description
Cost estimates in support of the CERCLA Feasibility Study for University of California, Davis areas of responsibility at the Laboratory for Energy-Related Health Research/Old Campus Landfill Site. Use Modified System Costs to add custom cost assemblies.

Estimate Documentation Report

Site Documentation:

Site ID: LEHR/OCL
Site Name: Alternative SW-10
Site Type: Land Disposal Units

Media/Waste Type
Primary: Soil
Secondary: N/A

Contaminant
Primary: Multi-Contaminant
Secondary: Radioactive (Low Level)

Phase Names
Pre-Study:
Study:
Design:
Removal/Interim Action:
Remedial Action:
Operations & Maintenance:
Long Term Monitoring:
Site Closeout:

Documentation
Description: Alternative SW-10. Excavate and Dispose of Waste Off-Site, Institutional Controls, Drainage Enhancements, and Groundwater Monitoring.

See Section 5 of the FS for a description of this alternative.
Support Team: Weiss Staff
References: RACER 2010 System Costs Database

Estimate Documentation Report

Estimated Costs:

Phase Names	Direct Cost	Marked-up Cost
Biological Survey	$34,759	$86,304
Decontamination Facilities	$520,561	$1,157,352
Institutional Controls	$445,672	$1,039,283
Building D&D	$319,118	$511,850
Elderberry Mitigation	$270,000	$270,000
Clearing and Grubbing	$29,533	$54,151
Decommission GW Monitoring Wells	$440,895	$624,402
ET Excavation	$424,536	$690,687
ET VOC "Hot Spot" Excavation	$156,452	$252,758
Materials Management	$4,577,262	$7,366,984
Demolish LFU-3 N-S Drainage Channel	$6,850	$10,264
LFU-3 Excavation	$547,716	$893,073
LFU-1 Excavation	$1,675,188	$2,775,120
ST and HFSDA Excavation	$134,585	$206,155
LFU-3 Drainage Channels	$50,707	$91,539
Off-Site Transportation and Disposal	$69,791,768	$83,868,657
LFU-1 Drainage Swale	$10,442	$18,841
LFU-2 VOC "Hot Spot" Excavation	$156,716	$253,312
LFU-2 Excavation	$1,580,453	$2,619,614
WBH Excavation	$298,087	$478,752
Install New GW Monitoring Wells	$206,121	$297,551
Building Reconstruction	$423,616	$423,616
Groundwater and Storm Water Monitoring	$2,799,569	$3,775,150
O&M Drainage System	$1,000	$1,000
Five-Year Reviews	$63,558	$159,250
Total Cost:	$84,965,162	$107,925,664

Estimate Documentation Report

Phase Documentation:

Phase Type: Study
Phase Name: Biological Survey
Description: Perform biological survey of Site prior to remedial action to assess population abundance and diversity of selected plant and animal species.

Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
RCRA Facility Investigation	Yes	100	0

Total Marked-up Cost: $86,304

Technologies:

Estimate Documentation Report

Technology Name: **RCRA Facility Investigation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Scoping		No	n/a
Site Characterization		Yes	n/a
Install Groundwater Monitoring Wells		No	n/a
Sampling and Analysis (S&A)		No	n/a
Other Investigations		No	n/a
Site Distance		70	MI
Site Complexity		Low	n/a
Site Charact.			
Required Parameters			
Fieldwork Support		No	n/a
Evaluate Site Geology/Hydrogeology		No	n/a
Evaluate Site Soils/Surface Hydrology		No	n/a
Evaluate Site Meteorology		No	n/a
Evaluate Populations and Land Usage		No	n/a
Evaluate Site Ecology		Yes	n/a
Evaluate Nature and Extent of Contamination		No	n/a
Evaluate Contaminant Fate and Transport		No	n/a
Conduct Baseline Risk Assessment		No	n/a
Compose RFI Report		Yes	n/a

Comments: On-Site biological survey with particular emphasis on threatened and endangered species prior to commencement of any remedial activities.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Institutional Controls
Description: Implement and maintain Institutional/Land Use Controls to prohibit Site development or activities incompatible with designated land use.

Approach: In Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
INITIAL LAND SURVEY	Yes	5	95
ADMINISTRATIVE LAND USE CONTROLS	Yes	100	0

Total Marked-up Cost: $1,039,283

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **INITIAL LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		INITIAL LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey crew to establish legal boundaries defining the Site's boundaries. Licensed surveyor report. 3 man survey crew - 5 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Rename Model		ADMINISTRATIVE LAND USE CONTROLS	n/a
Planning Documents		Yes	n/a
Planning Documents: Start Date		2010	n/a
Implementation		Yes	n/a
Implementation: Start Date		2010	n/a
Monitoring & Enforcement		Yes	n/a
Monitoring & Enforcement: Start Date		2010	n/a
Modification/Termination		No	n/a
Type of Site		Former Government Site	n/a
Planning Documents			
Required Parameters			
LUC Assurance Plan (LUCAP)		Yes	n/a
LUC Assurance Plan (LUCAP): Plan Complexity		Medium	n/a
LUC Implementation Plan (LUCIP)		Yes	n/a
LUC Implementation Plan (LUCIP): Number		1	EA
LUC Implementation Plan (LUCIP): Plan Complexity		Medium	n/a
Long-term Stewardship (LTS) Plan		No	n/a
Memorandum of Agreements (MOA)		No	n/a
Installation (or City) Master Plan		No	n/a
Construction Permitting		Yes	n/a
Construction Permitting: Number		1	EA
Construction Permitting: Plan Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Plan Complexity		Low	n/a
Planning Meetings			
Required Parameters			
LUCAP: Number of Meetings		2	EA
LUCAP: Number of People		2	EA

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Planning Meetings			
Required Parameters			
LUCAP: Number of Days		1	EA
LUCAP: Airfare Cost		0	$
LUCAP: Mileage to Meeting Site		70	MI
LUCIP: Number of Meetings		2	EA
LUCIP: Number of People		2	EA
LUCIP: Number of Days		1	EA
LUCIP: Airfare Cost		0	$
LUCIP: Mileage to Meeting Site		70	MI
Construction Permitting: Number of Meetings		1	EA
Construction Permitting: Number of People		1	EA
Construction Permitting: Number of Days		1	EA
Construction Permitting: Airfare Cost		0	$
Construction Permitting: Mileage to Meeting Site		70	MI
GIS/Overlay Maps: Number of Meetings		1	EA
GIS/Overlay Maps: Number of People		1	EA
GIS/Overlay Maps: Number of Days		1	EA
GIS/Overlay Maps: Airfare Cost		0	$
GIS/Overlay Maps: Mileage to Meeting Site		70	MI
Implementation			
Required Parameters			
Modify Installation (or City) Master Plan		No	n/a
Deed Notification		Yes	n/a
Deed Notification: Number		1	EA
Deed Notification: Task Complexity		Low	n/a
Negotiating Easements		No	n/a
Restrictive Covenants		Yes	n/a
Restrictive Covenants: Number		1	EA
Restrictive Covenants: Task Complexity		Low	n/a
Equitable Servitudes		No	n/a
Access Control Signs		Yes	n/a

Estimate Documentation Report

Technology Name: **Administrative Land Use Controls (# 1)**
User Name: **ADMINISTRATIVE LAND USE CONTROLS**

Description	*Default*	*Value*	*UOM*
Implementation			
Required Parameters			
Access Control Signs: Number		22	EA
Access Control Signs: Task Complexity		Low	n/a
Utility Notification Service		Yes	n/a
Access Control Signs: Number		1	EA
Access Control Signs: Task Complexity		Low	n/a
Geographic Information Systems (GIS)/Overlay Maps		Yes	n/a
Geographic Information Systems (GIS)/Overlay Maps: Number		1	EA
Geographic Information Systems (GIS)/Overlay Maps: Task Complexity		Low	n/a
Develop Finding of Suitability to Transfer (FOST)		No	n/a
Monitoring & Enforcement			
Required Parameters			
Duration of Monitoring/Enforcement		31	Years
Notice Letters		No	n/a
Guard Service/Security		No	n/a
Reports & Certifications		Yes	n/a
Reports & Certifications: Frequency		Annually	n/a
Site Visits/Inspections		Yes	n/a
Site Visits/Inspections: Number		1	EA
Site Visits/Inspections: Safety Level		D	n/a
Site Visits/Inspections: Duration		1	Days
Site Visits/Inspections: Number of People		2	EA
Site Visits/Inspections: Frequency		Annually	n/a
Site Visits/Inspections: Airfare		0	$ Per Ticket
Site Visits/Inspections: Mileage		70	MI

Comments: Implement and maintain land use controls to prohibit Site development or activities incompatible with designated land use.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decontamination Facilities
Description: Provide decontamination facilities for equipment and personnel throughout duration of the remedial action.

Approach: Ex Situ
Start Date: January, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Decontamination Facilities	Yes	100	0

Total Marked-up Cost: $1,157,352

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		1,102,240	$
Percentage	17.9	5	%
Dollar Amount		55,112	$

Comments:

Estimate Documentation Report

Technology Name: **Decontamination Facilities (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
New Decontamination Facility Pad Construction		No	n/a
Equipment Rating		n/a	n/a
Equipment Decontamination Operations		Yes	n/a
Equipment Decontamination Operations: Duration		72	weeks
Personnel Decontamination Trailers		Yes	n/a
Personnel Decontamination Trailers: Average Crew Size		10	per shift
Personnel Decontamination Trailers: Duration		72	weeks
Safety Level		D	n/a
Work Shifts			
Secondary Parameters			
Equipment Decontamination	One Shift per Day		n/a
Personnel Decontamination	One Shift per Day		n/a

Comments: Decontamination facilities for equipment and personnel during duration of remedial action. Assume average crew size during remedial action is 10. Assume remedial action lasts up to 72 weeks.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Elderberry Mitigation
Description: Identify elderberry shrub clusters within work boundaries and relocate them within UC boundaries.

Approach: None
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ELDERBERRY SHRUB CLUSTER RELOCATION	No	0	0

Total Marked-up Cost: $270,000

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **ELDERBERRY SHRUB CLUSTER RELOCATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ELDERBERRY SHRUB CLUSTER RELOCATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.02	n/a
Safety Level		D	n/a

Comments: Cost for Elderberry mitigation based on previous transplanting operations at UC Davis.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building D&D
Description: Prior to implementation of the alternative, nine Site buildings will be demolished and associated demolition material will be disposed off-Site. It is assumed that five percent of the demolition waste is contaminated with asbestos, lead, and PCBs. Non-hazardous building material will be recycled or disposed of off-Site. No documentation suggests historical use of radionuclides in these buildings, therefore, it is assumed they are not radiologically contaminated.
Apply 15% contingency for worker safety and additional waste volume.

Approach: Ex Situ
Start Date: February, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Demolition, Buildings	Yes	10	90
Professional Labor Management	Yes	100	0
D&D, Sampling and Analysis	Yes	100	0

Total Marked-up Cost: $511,850

Technologies:

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		630	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		33.25	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		1.75	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Cobalt-60 Annex (H-290). Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 1 (H-292). Site visit on 4-12-10 found H-292 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		5,285	SF
Type of Building		Steel	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0044	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		266	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		14	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Geriatrics Building No. 2 (H-293). Site visit on 4-12-10 found H-293 was steel construction. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X1 (H-236). Site visit on 4-12-10 found Building X1 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X2 (H-234). Site visit on 4-12-10 found Building X2 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X3 (H-237). Site visit on 4-12-10 found Building X3 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 7)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X4 (H-232). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 8)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		500	SF
Type of Building		Concrete	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0072	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		41.8	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		2.2	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose Animal Housing Building X5 (H-231). Site visit on 4-12-10 found Building X4 was concrete walls with steel roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Demolition, Buildings (# 9)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Building Area		1,200	SF
Type of Building		Wood	n/a
Include Load and Haul Costs		Yes	n/a
Amount of Hazardous Material		5	%
Number of Stories		Single	n/a
Safety Level		D	n/a
Height/Demo Factor			
Secondary Parameters			
Floor to Floor Height	12	12	FT
Demolition Factor	0.03	0.0046	CY/CF
Load and Haul			
Secondary Parameters			
Non-Hazardous Material: Truck Type		Highway	n/a
Non-Hazardous Material: Volume		63.65	CY
Non-Hazardous Material: Distance (One-way)		93	MI
Non-Hazardous Material: Dump Charge		15	$/CY
Hazardous Material: Truck Type		Highway	n/a
Hazardous Material: Volume		3.35	CY
Hazardous Material: Distance (One-way)		200	MI
Hazardous Material: Dump Charge		35	$/CY

Comments: Demolish, dispose storage building (H-253) near northwest corner of Landfill No. 3. Site visit on 4-12-10 found Building was wood construction with metal roof. Assume 5% of material is considered hazardous due to lead, asbestos, and/or PCBs. This material will be disposed at a Class I Landfill accepting hazardous waste. This module does not allow distance to landfill to exceed 200 miles (approximated distance is 230 miles). Assume disposal fee for non-RCRA hazardous waste (i.e. California haz waste) is $85/ton + $17 in taxes = $102/ton (assume for C&D waste, 4 CY/ton); use default $35/CY disposal for hazardous demolition waste.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		191,492	$
Percentage	19.8	19.8	%
Dollar Amount		37,915	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Mobilizations		1	EA
Mobilization Distance		70	MI (One-way)
Soil/Sediment: # of Samples		0	EA
Soil/Sediment: Survey Area		0	SF
Water/Liquid: # of Samples		0	EA
Water/Liquid: Survey Area		0	SF
Building Surfaces: # of Samples		141	EA
Building Surfaces: Survey Area		43,287	SF
Sampling Rate		75	Per Day
Sampling Crew Size		2 Radiation Technicians, 1 Health and Safety Officer	n/a
Safety Level		D	n/a
Laboratory Analyses			
Required Parameters			
Soil: Alpha		No	n/a
Soil: Beta		No	n/a
Soil: Gamma		No	n/a
Soil: VOC"s		No	n/a
Soil: SVOC"s		No	n/a
Soil: Fuels		No	n/a
Soil: Pesticides		No	n/a
Soil: PCB"s		No	n/a
Soil: Metals		No	n/a
Soil: Acids/Caustics		No	n/a
Soil: Ordnance Residual		No	n/a
Water: Alpha		No	n/a
Water: Beta		No	n/a
Water: Gamma		No	n/a
Water: VOC"s		No	n/a
Water: SVOC"s		No	n/a

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Laboratory Analyses			
Required Parameters			
Water: Fuels		No	n/a
Water: Pesticides		No	n/a
Water: PCB"s		No	n/a
Water: Metals		No	n/a
Water: Acids/Caustics		No	n/a
Water: Ordnance Residual		No	n/a
Building: Alpha		No	n/a
Building: Beta		No	n/a
Building: Gamma		No	n/a
Building: VOC"s		No	n/a
Building: SVOC"s		No	n/a
Building: Fuels		No	n/a
Building: Pesticides		No	n/a
Building: PCB"s		Yes	n/a
Building: Metals		Yes	n/a
Building: Acids/Caustics		No	n/a
Building: Ordnance Residual		No	n/a
QA Blanks: Soil/Sediment		0	%
QA Blanks: Water/Liquid		0	%
QA Blanks: Building		15	%
Hand Scanning		1	Days
Adjustments/Productivity			
Secondary Parameters			
Turnaround Time		Standard (21 Days)	n/a
Quality Control		Level 1	n/a
Height Adjustment	15	15	%
Protective Clothing	23	23	%
RADCON	15	15	%
Respiratory Protection	38	38	%
Breaks	10	10	%

Estimate Documentation Report

Technology Name: **D&D, Sampling and Analysis (# 1)**

Description	*Default*	*Value*	*UOM*
Adjustments/Productivity			
Secondary Parameters			
Productivity Loss Multiplier	2.32	n/a	n/a

Comments: Conduct sampling and analysis of the nine buildings that will need to be removed prior to the remedial action. Assume 1 mobilization from a distance of 70 miles. One sample per ~300 ft2. Assume 75 samples can be collected per day. Analyze for asbestos, PCBs, and metals. At two Geriartics Buildings H-292 and H-293, include radiological analyses.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Decommission GW Monitoring Wells
Description: Decommission groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	100	0
Residual Waste Management	Yes	80	20
Well Abandonment	Yes	20	80

Total Marked-up Cost: $624,402

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		594,669	$
Percentage	19	5	%
Dollar Amount		29,733	$

Comments:

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		41	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Estimate Documentation Report

Technology Name: **Well Abandonment (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Abandon Wells			
Required Parameters			
Technology/Group Name		DDC Wells	n/a
Number of Wells		3	EA
Well Depth		85	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		TP-1 through TP-5	n/a
Number of Wells		5	EA
Well Depth		81	FT
Well Diameter		12	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-1 Wells	n/a
Number of Wells		6	EA
Well Depth		64	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a
Technology/Group Name		HSU-2 Well	n/a
Number of Wells		1	EA
Well Depth		86	FT
Well Diameter		4	IN
Well Abandonment Method		Overdrill / Removal	n/a
Formation Type		Unconsolidated	n/a

Comments:

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET Excavation
Description: Excavate waste cell contents in ET North and ET South, including contact soil and surrounding contaminated soil to depth of waste plus 2 feet overexcavation (use avg. trench depth + 2 feet for costing purposes). Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Load and haul ET excavated material to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work and backfill requirements.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Excavation	Yes	5	95

Total Marked-up Cost: $690,687

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Eastern Trenches excavation. 3 man survey crew - 4 x 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		8,358	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET excavated material to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		542,547	$
Percentage	19.1	19.1	%
Dollar Amount		103,626	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,171	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	10	10	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate ET North. Average waste cell depth = 8 ft bgs.

Collect confirmation samples.

Backfill and compact with clean imported fill.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		4,799	CY
Depth		8	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	12	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	33	33	EA
Number of Composites Submitted to Lab	9	9	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate ET South.

Confirmation sampling.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Clearing and Grubbing
Description: Clear and grub areas to be excavated and/or capped.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80
Clear and Grub	Yes	20	80

Total Marked-up Cost: $54,151

Technologies:

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		2.42	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 1)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		424.830993652344	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 1 footprint.
Current satellite photo and photographs from recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume grubbed material will be kept on-site for re-use.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		3.88	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 2)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		681.134033203125	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear all trees and vegetation within Landfill Unit 2/Eastern Trenches/Southern Trenches/Waste Burial Holes/HFSDA footprint.
Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range.
Assume chipping and stockpiling is done on-site.

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Acres		1.01	AC
Dry Soil		90	%
Wet Soil		10	%
Include Load and Haul Costs		Yes	n/a
Safety Level		D	n/a
Clearing			
Secondary Parameters			
Brush Density	Medium	Light	n/a
Debris Reduction	None	Chipping	n/a
Trees Per Acre (<= 6")	0	0	EA/AC
Trees Per Acre (> 6" & <= 12")	0	0	EA/AC
Trees Per Acre (> 12" & <= 24")	50	5	EA/AC
Trees Per Acre (> 24" & <= 36")	0	0	EA/AC
Stumps Per Acre (<= 6")	0	0	EA/AC
Stumps Per Acre (> 6" & <= 12")	0	0	EA/AC
Stumps Per Acre (> 12" & <= 24")	50	5	EA/AC
Stumps Per Acre (> 24" & <= 36")	0	0	EA/AC
Grubbing			
Secondary Parameters			
Grubbing Depth	6	6	IN
Bulk Factor	1.2	1.2	n/a
Equipment	Dozer - 105hp	Dozer - 105hp	n/a
Soil Stripping			
Secondary Parameters			
Soil Depth	0	0	IN
Stripping Area	0	0	%
Soil Equipment	Dozer - 200hp	Dozer - 200hp	n/a
Disposal	Stockpiling	Stockpiling	n/a
Bulk Factor	1.2	1.2	n/a
Load and Haul			
Secondary Parameters			
Truck Type		Highway	n/a

Estimate Documentation Report

Technology Name: **Clear and Grub (# 3)**

Description	*Default*	*Value*	*UOM*
Load and Haul			
Secondary Parameters			
Volume		177.30549621582	CY
One-way Haul Distance		1	MI
Dump Charge		0	$/CY

Comments: Clear trees and vegetation at Landfill Unit 3. Current satellite photo and photographs frrom recent field activities show light brush density with approximately 5 trees per acre. Typical tree diameter in 1 foot to 2 foot diameter range. Assume grubbed material is stored and re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Materials Management
Description: Excavated material will be handled in accordance with a Materials Management Plan. Materials Management includes the cost of storage/stockpiling, sorting of waste streams, waste characterization, and staging for final disposal. Disposal is handled in a separate cost element. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Bulk Material Storage	Yes	20	80
Bulk Material Storage	Yes	20	80
SIFTING OF EXCAVATED MATERIAL	Yes	20	80
Drum Staging	Yes	20	80
LOADER FOR STAGING AREA	Yes	0	100
WASTE CHARACTERIZATION SAMPLING	Yes	100	0
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $7,366,984

Technologies:

Estimate Documentation Report

Technology Name: **Bulk Material Storage (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Roll-Off/Bulk Containers/Tanks	n/a
Quantity of Material		1,116	CY
Safety Level		C	n/a
Secondary			
Secondary Parameters			
Size	30 CY Open Top Roll-Off Container	30 CY Open Top Roll-Off Container	n/a
Quantity	42	41.33333	n/a

Comments: Bulk containers for PTW.

Estimate Documentation Report

Technology Name: **Bulk Material Storage (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Bulk Solid		Yes	n/a
Bulk Liquid/Sludge		No	n/a
Drummed Solid, Liquid, or Sludge		No	n/a
Type of Storage Facility		Soil Bermed Storage Area	n/a
Quantity of Material		123,386	CY
Safety Level		D	n/a
Secondary			
Secondary Parameters			
Storage Area Quantity	1	1	EA
Storage Area Length	392	392	FT
Storage Area Width	392	392	FT
Berm Height	2	2	FT
Berm Top Width	2	2	FT
Slope: Feet Run / 1 Foot Rise	3	3	FT
Polymeric Liner Material	40 Mil Polymeric Liner, PVC	40 Mil Polymeric Liner, PVC	n\a
Polymeric Liner Quantity	1	1	EA
Soil Liner Material	None	None	n/a
Soil Liner Thickness	0	0	IN
Liner Protection Layer Material	Gravel	Gravel	n/a
Liner Protection Layer Thickness	12	12	IN

Comments: Stockpile TEV.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **SIFTING OF EXCAVATED MATERIAL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		SIFTING OF EXCAVATED MATERIAL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.90	n/a
Safety Level		C	n/a

Comments: Sorting of excavated material to segregate principal threat wastes. Assume the use of similar equipment used under the MEC Sifting assembly. Assume rate of sorting is approximately 200 CY/day.

Estimate Documentation Report

Technology Name: **Drum Staging (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Type of Waste		Solid	n/a
Solid: To be Staged		279	EA
Solid: Leaking/Damaged Requiring Overpacks		0	EA
Solid: To be Sampled		279	EA
Solid: Second Sample per Drum		No	n/a
Temporary Staging Area		3,256	SF
Drums to be Consolidated (Drums to Bulk)		279	EA
Drum Average Percentage Full		65	%
Safety Level		C	n/a
Handling			
Secondary Parameters			
Overpacks		85 Gal. Steel Salvage Drum	n/a
First Sample Analysis: Liquid		Waste Characterization, Liquid	n/a
First Sample Analysis: Solid / Sludge		Waste Characterization, Solids Includes Rads	n/a
Second Sample Analysis: Liquid		None	n/a
Second Sample Analysis: Solid / Sludge		None	n/a
Storage			
Secondary Parameters			
Liner/Temporary Staging Area	60 Mil Polymeric Liner, HDPE	60 Mil Polymeric Liner, HDPE	n/a
Drum Storage Systems: Quantity	0	0	EA
Drum Storage Systems: Type	Poly Spill Pallet, 4 Drum Cap	Poly Spill Pallet, 4 Drum Cap	n/a
Containment Berms: Quantity	0	0	EA
Containment Berms: Type	10" x 10" x 17", 750 Gallon	10" x 10" x 17", 750 Gallon	n/a

Comments: Drums for principal threat wastes/lab packs.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **LOADER FOR STAGING AREA**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LOADER FOR STAGING AREA	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.03	n/a
Safety Level		D	n/a

Comments: One 3 CY front end loader, bobcat, and all-terrain forklift for use in staging area when stockpiled dirt needs to be moved around. This need will result from waste characterization results indicating that material from one stockpile should be classified differently.

Technology Name: **User Defined Estimate (# 3)**
User Name: **WASTE CHARACTERIZATION SAMPLING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WASTE CHARACTERIZATION SAMPLING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.06	n/a
Safety Level		D	n/a

Comments: Assume the included materials and analyses for waste characterization prior to final disposal of TEV from excavated areas.
Assume 1 sample per 300 CY for costing purposes only. Actual sampling rate will be considered during remedial design.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		2,314,697	$
Percentage	15.5	15.5	%
Dollar Amount		358,778	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ET VOC "Hot Spot" Excavation
Description: Excavate ET VOC "Hot Spot." Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95

Total Marked-up Cost: $252,758

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,686	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ET VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		199,844	$
Percentage	19.8	19.8	%
Dollar Amount		39,569	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,204	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	52	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	9	9	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate the ET VOC "Hot Spot" to a depth of 20 feet bgs.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Demolish LFU-3 N-S Drainage Channel
Description: The concrete lined drainage channel which partially overlays LFU-3 will be removed.
New N-S drainage channels will be re-constructed post-remediation.
This cost estimate assumes that a termporary drainage channel will not have to be created since the remedial action will take place in the dry season.

Approach: Ex Situ
Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
DEMOLISH LFU3 N-S DRAINAGE CHANNEL	Yes	100	0

Total Marked-up Cost: $10,264

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **DEMOLISH LFU3 N-S DRAINAGE CHANNEL**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DEMOLISH LFU3 N-S DRAINAGE CHANNEL	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.01	n/a
Safety Level		D	n/a

Comments: Demolish gunnite lined north-south drainage channel overlaying Landfill Unit 3. Assume thickness of gunnite lining = 2 inches, length of channel is 270 feet, top width of channel is 30 feet, base width of channel is 16 feet, depth of channel is 7 feet. Assume 270 feet of the channel will need to be demolished. The channel will be demolished to remove underlying waste. The channel will be restored in its original location, but without concrete lining. Demolished concrete will be re-used on-site.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Excavation
Description: Excavate LFU-3 waste cells. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean fill. Revegetate surface. Load and haul Landfill Unit 3 soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: May, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $893,073

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		695,026	$
Percentage	18.8	18.8	%
Dollar Amount		130,665	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		9,920	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	12	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	54	54	EA
Number of Composites Submitted to Lab	14	14	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 3 waste cells.
Collect default number of confirmation samples.
Backfill and compact with clean fill. Revegetate surface.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		13,889	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul Landfill Unit 3 excavated material to stockpiling areas. Assume stockpile area is immediately adjacent to LFU-3 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Landfill Unit 3 excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Excavation
Description: Excavate LFU-1. Conduct land survey of on-Site backfill locations/volumes. 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: June, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0

Total Marked-up Cost: $2,775,120

Technologies:

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		2,246,094	$
Percentage	15.7	15.7	%
Dollar Amount		352,637	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		32,829	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	7	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	163	163	EA
Number of Composites Submitted to Lab	41	41	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Landfill Unit 1 Non-Drainage Area and LFU-1 Drainage Area.
Collect confirmation samples.
Backfill/compact clean fill to promote drainage, assume 0% of excavated material used as backfill.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		45,960	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul Landfill Unit 1 excavated material to stockpiling areas.
Assume stockpile area is immediately adjacent to LFU-1 on northern boundary assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Landfill Unit 1 excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: ST and HFSDA Excavation
Description: Excavate ST and HFSDA.
Confirmation samples will be collected after excavation.
Backfill and compact clean fill in ST and HFSDA excavation footprint.
Conduct land survey of excavation boundaries.
Assumes 15% contingency for radiological worker safety.

Approach: In Situ
Start Date: June, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
EXCAVATED MATERIAL MONITORING	Yes	100	0
LAND SURVEY OF EXCAVATION	Yes	10	90
Professional Labor Management	Yes	80	20
Excavation	Yes	100	0
Excavation	Yes	100	0
Load and Haul	Yes	20	80

Total Marked-up Cost: $206,155

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of ST and HFSDA excavation. 3 man survey crew - 2 x 1/2 days. Survey crew would have to come out during different phases of the excavation (assume 3 different times). Licensed surveyor report.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		156,640	$
Percentage	19.8	19.8	%
Dollar Amount		31,015	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		461	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	22	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	6	6	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: The HFSDA will be excavated, and excavated material will be disposed off-Site. Confirmation samples will be collected. The excavation will be backfilled with clean fill and will be re-seeded.

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,562	CY
Depth		6	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	14	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	15	15	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Southern Trenches will be excavated. ST will be backfilled with clean fill and will be re-seeded.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		2,832	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul ST and HFSDA soil and waste to stockpiling areas. Assume stockpile area is to the north of ST, assume 500 feet transport distance.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-3 Drainage Channels
Description: The concrete lined drainage channel which partially overlays LFU-3, will be reconstructed post-remediation.
The E-W LFU-3 drainage channel will also be reconstructed south of its original location.

Approach: Ex Situ
Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
E-W DITCH CONSTRUCTION	Yes	20	80
N-S DRAINAGE CHANNEL CONSTRUCTION	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $91,539

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **E-W DITCH CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		E-W DITCH CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Construction of new east-west drainage ditch at LFU-3, south of its original location. Assume 260 feet needed. This drainage ditch currently drains the Raptor Center and vicinity. It will discharge into the larger N-S concrete lined drainage ditch.

Technology Name: **User Defined Estimate (# 2)**
User Name: **N-S DRAINAGE CHANNEL CONSTRUCTION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		N-S DRAINAGE CHANNEL CONSTRUCTION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: Reconstruction of north-south, drainage ditch. Assume 270 feet need to be restored. Dirt/grass lining.

Technology Name: **User Defined Estimate (# 3)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage channels. 2 x 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Off-Site Transportation and Disposal
Description: Transport and dispose of RCRA hazardous, mixed waste, Non-RCRA hazardous, LLRW, and non-hazardous waste material generated by Site remedial excavations. Hazardous wastes will be transported to Class I hazardous waste facility; solid LLRW and mixed waste to LLRW accepting facility; and non-hazardous materials at Class II non-hazardous landfill. Assume drummed PTW will be sent to the LLRW accepting facility, and biological waste will be incinerated.

Approach: Ex Situ
Start Date: September, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
Off-site Transportation and Thermal Treatment	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0
Off-site Transportation and Waste Disposal	Yes	100	0

Total Marked-up Cost: $83,868,657

Technologies:

Estimate Documentation Report

Technology Name: **Off-site Transportation and Thermal Treatment (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid		312	CY
Distance to Off-site Facility (One-way)		2,433	MI
Safety Level		D	n/a
Treatment Type			
Required Parameters			
Treatment Type		Incineration	n/a
Treatment Fees			
Secondary Parameters			
Type of Treatment Fees	Average Treatment Fee	Average Treatment Fee	n/a
Amount of Treatment Fees	1,300	1,300	$/CY
Amount of State Tax/Fee (for Hazardous Waste)	0	0	$/CY

Comments: Incinerate biological waste sent for off-Site disposal.

Technology Name: **Off-site Transportation and Waste Disposal (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Non-leaking Drums	n/a
Quantity of Non-Leaking Drums		279	Drums
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dipose of drums containing PTW requiring stabilization. Assume default acceptance and treatment fee. Assume 594 mile transport distance.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Low-Level Radioactive Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		44,517	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose LLRW. Assume $1,080/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Radioactive - Mixed Waste	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		2,164	CY
Radioactive Disposal Location		Energy Solutions, UT	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		594	MI
Safety Level		D	n/a

Comments: Transport and dispose mixed waste. Assume $2,814/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		49,124	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose RCRA hazardous waste. Assume $170/CY fee and 1 CY=1 ton.

Technology Name: **Off-site Transportation and Waste Disposal (# 5)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		7,843	CY
Stabilization		Not Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		227	MI
Safety Level		D	n/a

Comments: Transport and dispose non-RCRA hazardous waste. Assume $85/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Technology Name: **Off-site Transportation and Waste Disposal (# 6)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Waste Type		Non-Hazardous	n/a
Waste Form		Solid	n/a
Condition of Waste		Bulk to remain as bulk	n/a
Volume of Bulk Solid Waste		19,426	CY
Stabilization		Required	n/a
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	MI
Safety Level		D	n/a

Comments: Transport and dispose non-hazardous waste. Assume $19.50/CY fee and 1 CY=1 ton.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-1 Drainage Swale
Description: Install a north-south trending unlined storm drainage channel in LFU-1 drainage area (assume 380 ft).

Approach: Ex Situ
Start Date: October, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
LFU-1 DRAINAGE SWALE	Yes	20	80
LAND SURVEY	Yes	5	95

Total Marked-up Cost: $18,841

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **LFU-1 DRAINAGE SWALE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LFU-1 DRAINAGE SWALE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.03.11	n/a
Safety Level		D	n/a

Comments: North-south trending unlined storm drainage channel will be constructed in LFU-1 drainage area (assume 380 ft).

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Survey newly constructed drainage improvements. 1/2 day. Registered surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 Excavation
Description: Excavate LFU-2 waste cells. Monitor air during remedial action. Survey excavation areas and depths prior to backfilling. Backfill and compact excavation with clean fill. Revegetate surface. Load and haul Landfill Unit 2 soil and waste to stockpiling areas. Pre-screen waste with geiger counter and PID for potential LLRW or hazardous wastes. Include radiological work contingency (15%).

Approach: In Situ
Start Date: March, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
LAND SURVEY OF EXCAVATION	Yes	10	90

Total Marked-up Cost: $2,619,614

Technologies:

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		2,118,814	$
Percentage	15.9	15.9	%
Dollar Amount		336,891	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		30,528	CY
Depth		13	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	10	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	124	124	EA
Number of Composites Submitted to Lab	31	31	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate waste cells in Landfill Unit 2.

Excavation to be backfilled and compacted with clean fill.

Estimate Documentation Report

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		42,740	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul Landfill Unit 2 TEV to stockpiling areas.
Assume stockpile area is to the east of LFU-2, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 1)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of Landfill Unit 2 excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: LFU-2 VOC "Hot Spot" Excavation
Description: Excavate LFU-2 VOC "Hot Spot." Apply 15% contingency for radiological work.

Approach: In Situ
Start Date: March, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
LAND SURVEY OF EXCAVATION	Yes	10	90
Load and Haul	Yes	20	80
EXCAVATED MATERIAL MONITORING	Yes	100	0
Professional Labor Management	Yes	80	20

Total Marked-up Cost: $253,312

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		1,210	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		C	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	52	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	9	9	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate the LFU-2 VOC "Hot Spot" to a depth of 20 feet bgs.

Level C safety assumed due to VOC impacted soil.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of excavation. 3 man survey crew - 1/2 days. Licensed surveyor report.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		1,693	CY
One-way Haul Distance		500	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul LFU-2 VOC "Hot Spot" TEV to stockpiling areas.
Assume stockpile area is to the east of ET, assume 500 feet transport distance.

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		C	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		200,473	$
Percentage	19.7	19.7	%
Dollar Amount		39,493	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: WBH Excavation
Description: Excavate the WBH subareas. Load and haul excavated material to stockpiling area. Backfill and compact the excavation with clean fill. Conduct land survey of excavation. No solid waste is expected in the WBH as it underwent a removal action in 2000.

Approach: In Situ
Start Date: June, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Contingency 15% Markup Template_with Owner Cost

Technology Markups	Markup	% Prime	% Sub.
Excavation	Yes	5	95
Excavation	Yes	5	95
Excavation	Yes	5	95
Professional Labor Management	Yes	80	20
Excavation	Yes	5	95
Load and Haul	Yes	20	80
LAND SURVEY OF EXCAVATION	Yes	10	90
EXCAVATED MATERIAL MONITORING	Yes	100	0

Total Marked-up Cost: $478,752

Technologies:

Estimate Documentation Report

Technology Name: **Excavation (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		669	CY
Depth		5	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	None	None	n/a
% of Excavated Material To Be Used as Backfill	0	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	8	8	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Waste Burial Hole Intermediate soil. Assume average excavation depth = 15 ft bgs (5 feet below WBH Shallow excavation floor).

Collect confirmation samples in 25'x25' grid (default Racer), 4-point composites.

Backfill and compact with clean fill.

Estimate Documentation Report

Estimate Documentation Report

Technology Name: **Excavation (# 2)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		191	CY
Depth		5	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	None	None	n/a
% of Excavated Material To Be Used as Backfill	0	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	5	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate Waste Burial Hole Deep soil. Assume average excavation depth = 20 ft bgs (five feet below WBH Intermediate excavation floor).

Collect confirmation samples in 25'x25' grid (default Racer), 4-point composites.

Backfill and compact with clean fill.

Estimate Documentation Report

Estimate Documentation Report

Technology Name: **Excavation (# 3)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		31	CY
Depth		20	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	87	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	5	5	EA
Number of Composites Submitted to Lab	5	5	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate contaminated Waste Burial Hole Deep (south) soil to 20 feet bgs.

Collect confirmation samples in 25'x25' grid (default Racer), 4-point composites.

Backfill and compact with clean fill.

Estimate Documentation Report

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		371,269	$
Percentage	19.4	19.4	%
Dollar Amount		72,026	$

Comments: Professional Labor Management activities:
Project-specific planning documents (Work Plan, HASP, QAPP, materials handling plan, traffic control plan, etc.)
Shop Drawings & Technical Data
Analytical Data for Field Samples
Health Safety Monitoring and Reporting
Perimeter Air Quality Monitoring and Reporting
Preparation & Submittal of As-Built Drawings
Preparation of Waste Characterization Forms for Treatment/Disposal Facility Acceptance
Preparation, Tracking & Reporting of Manifests for Treatment/Disposal of Site Wastes

Estimate Documentation Report

Technology Name: **Excavation (# 4)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Estimating Method		Volume / Depth	n/a
Volume		3,557	CY
Depth		10	FT
Soil Type		Silt/Silty-Clay Mixture	n/a
Safety Level		D	n/a
Excavation			
Secondary Parameters			
Existing Cover	Soil/Gravel	Soil/Gravel	n/a
Replacement Cover	Soil/Seeding	Soil/Seeding	n/a
Sidewall Protection	Side Sloping	Side Sloping	n/a
Rise : Run	1	1	n/a
% of Excavated Material To Be Used as Backfill	18	0	%
Source of Additional Fill	Off Site	Off Site	n/a
Backfill Hauling Distance (one way)	10	20	MI
Dewatering Required	No	No	n/a
Analytical			
Secondary Parameters			
Primary Analytical Template	System Soil - Multi-Contaminant	System Soil - Multi-Contaminant	n/a
Secondary Analytical Template	System Soil - Low Level Radioactive	System Soil - Low Level Radioactive	n/a
Number of Sampling Points/Locations	23	23	EA
Number of Composites Submitted to Lab	6	6	EA
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Submit Data Electronically	Yes	Yes	n/a
Data Package / QC	Stage 1	Stage 1	n/a
Lab Data Review	Stage 1	Stage 1	n/a
Sampling Reports	Abbreviated	Abbreviated	n/a

Comments: Excavate contaminated Waste Burial Hole Shallow soil. Assume average excavation depth = 10 ft bgs.

Collect confirmation samples in 25'x25' grid (default Racer), 4-point composites.

Backfill and compact with clean fill.

Backfill and compact with clean fill.

Technology Name: **Load and Haul (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Truck Type		Off Highway	n/a
Volume		6,228	CY
One-way Haul Distance		700	FT
Dump Charge		0	$/CY
Safety Level		D	n/a

Comments: Load and haul excavated WBH material to stockpiling areas. Assume stockpile area is to the northeast of LFU-2, assume 700 feet transport distance.

Technology Name: **User Defined Estimate (# 1)**
User Name: **LAND SURVEY OF EXCAVATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY OF EXCAVATION	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		D	n/a

Comments: Survey boundaries of WBH excavation. 3 man survey crew - 4 x 1/2 days. Survey crew would have to come out during four different phases of the excavation (initial boundaries, after first stage, after second stage, after backfill). Licensed surveyor report.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 2)**
User Name: **EXCAVATED MATERIAL MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		EXCAVATED MATERIAL MONITORING	n/a
WBS Type		HTRW	n/a
Selected WBS		331.02.02	n/a
Safety Level		D	n/a

Comments: Monitor buckets of excavated material with geiger counter and PID instruments to tentatively identify LLRW, hazardous, or mixed wastes. Assume these instruments will be rented for the duration of excavation. Does not include ambient radiological/particulate monitoring.

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Install New GW Monitoring Wells
Description: Install, develop, and survey new groundwater monitoring wells according to Table 5-3.

Approach: In Situ
Start Date: August, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Professional Labor Management	Yes	80	20
WELL DEVELOPMENT	Yes	40	60
Groundwater Monitoring Well	Yes	40	60
Residual Waste Management	Yes	80	20
LAND SURVEY	Yes	5	95
DDC WELL AND PIEZOMETER INSTALLATION	Yes	100	0

Total Marked-up Cost: $297,551

Technologies:

Technology Name: **Professional Labor Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Markedup Construction Cost ($)		121,933	$
Percentage	19.9	5	%
Dollar Amount		6,097	$

Comments:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **WELL DEVELOPMENT**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		WELL DEVELOPMENT	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.01	n/a
Safety Level		D	n/a

Comments: Rent equipment for well develoment for 1 week. One equipment operator and one supervising engineer/geologist.

Estimate Documentation Report

Technology Name: **Groundwater Monitoring Well (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Number of Aquifers		Two	n/a
Include Guard Posts		No	n/a
Depth to Groundwater to Aquifer One		50	FT
Number of Wells to Aquifer One		9	EA
Depth to Groundwater to Aquifer Two		50	FT
Number of Wells to Aquifer Two		1	EA
Safety Level		D	n/a
Aquifer One			
Required Parameters			
Aquifer One: Average Well Depth		70	LF
Aquifer One: Formation Type		Unconsolidated	n/a
Aquifer One: Drilling Method		Hollow Stem	n/a
Aquifer One: Well Diameter		2 Inch	n/a
Aquifer One: Well Construction Material		PVC Schedule 80	n/a
Aquifer One: Split Spoon Sample Collection		Yes	n/a
Aquifer One: Average Number of Soil Samples per Well		0	EA
Aquifer One: Soil Analytical Template		None	n/a
Aquifer One: Safety Level		D	n/a
Aquifer Two			
Required Parameters			
Aquifer Two: Average Well Depth		105	LF
Aquifer Two: Formation Type		Unconsolidated	n/a
Aquifer Two: Drilling Method		Hollow Stem	n/a
Aquifer Two: Well Diameter		4 Inch	n/a
Aquifer Two: Well Construction Material		PVC Schedule 80	n/a
Aquifer Two: Split Spoon Sample Collection		Yes	n/a
Aquifer Two: Average Number of Soil Samples per Well		0	EA
Aquifer Two: Soil Analytical Template		None	n/a
Aquifer Two: Safety Level		D	n/a

Comments: Install new wells according to Table 5-3.

Estimate Documentation Report

Technology Name: **Residual Waste Management (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Safety Level		D	n/a
Non-Rad Disposal			
Required Parameters			
Waste Type / Condition		Non-Hazardous Bulk Solid	n/a
Total Quantity		10	CY
Transportation Type		Truck	n/a
Truck Distance (One-way)		93	Miles

Comments: Dispose of drill cuttings and well abandonment wastes, assume non-hazardous.

Technology Name: **User Defined Estimate (# 2)**
User Name: **LAND SURVEY**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		LAND SURVEY	n/a
WBS Type		HTRW	n/a
Selected WBS		321.20.91	n/a
Safety Level		E	n/a

Comments: Three man crew to survey newly installed groundwater monitoring wells. Registered surveyor report. 0.5 day

Technology Name: **User Defined Estimate (# 4)**
User Name: **DDC WELL AND PIEZOMETER INSTALLATION**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		DDC WELL AND PIEZOMETER INSTALLATION	n/a
WBS Type		HTRW	n/a
Selected WBS		331.06.90	n/a
Safety Level		D	n/a

Comments: Installation cost of 3 density-driven convection wells and 3 sets of nested piezometers (each nest containing 3 piezometers) as replacements for those decommissioned in the ET North.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Remedial Action
Phase Name: Building Reconstruction
Description: Replace buildings H-253, H-290, H-292, and H-293 with three new buildings during site restoration. The two Geriatrics buildings will be reconstructed. The LFU-3 storage building and Cobalt-60 Annex will replaced with one building equal in area to the two combined. The X buildings will not be replaced.

Approach: Ex Situ
Start Date: December, 2011
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0
USER DEFINED ESTIMATE	No	0	0

Total Marked-up Cost: $423,616

Technologies:

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 1)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-292 (Geriatrics Building No. 1)

Technology Name: **User Defined Estimate (# 2)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace H-293 (Geriatrics Building No. 2)

Technology Name: **User Defined Estimate (# 3)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Replace buildings H-253 and H-290 with one builing equivalen in square footage.

Estimate Documentation Report

Technology Name: **User Defined Estimate (# 4)**
User Name: **USER DEFINED ESTIMATE**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		USER DEFINED ESTIMATE	n/a
WBS Type		HTRW	n/a
Selected WBS		331.20.03	n/a
Safety Level		D	n/a

Comments: Add 20% contingency to cost of building reconstruction.

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Groundwater and Storm Water Monitoring
Description: Groundwater monitoring and storm water monitoring for lifetime of alternative until cleanup objectives are met. Sample collection, analysis, data validation, data import and monitoring reports.

Start Date: April, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
MONITORING	Yes	100	0

Total Marked-up Cost: $3,775,150

Technologies:

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		MONITORING	n/a
Groundwater		Yes	n/a
Surface Soil		No	n/a
Surface Water		Yes	n/a
Subsurface Soil		No	n/a
Sediment		No	n/a
Soil Gas		No	n/a
Air		No	n/a
Site Distance (One-way)		70	MI
Safety Level		D	n/a
Groundwater			
Required Parameters			
Average Sample Depth		50	FT
Samples per Event (First Year)		16	n/a
Samples per Event (Out Years)		16	n/a
Number of Events (First Year)		4	n/a
Number of Events (Out Years)		1	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	System Water - Low Level Radioactive	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Sampling Method	Existing Wells - Low Flow Pump	Existing Wells - Low Flow Pump	n/a
Number of Wells/Day	8	8	EA
Contain Purge Water	Yes	Yes	n/a
Surface Water			
Required Parameters			
Average Sample Depth		0	FT

Estimate Documentation Report

Technology Name: **Monitoring (# 1)**
User Name: **MONITORING**

Description	*Default*	*Value*	*UOM*
Surface Water			
Required Parameters			
Samples per Event (First Year)		3	n/a
Samples per Event (Out Years)		3	n/a
Number of Events (First Year)		2	n/a
Number of Events (Out Years)		2	n/a
Number of Years (Out Years)		29	n/a
Secondary Parameters			
Primary Analytical Template	System Water - Multi-Contaminant	System Water - Multi-Contaminant	n/a
Secondary Analytical Template	System Water - Low Level Radioactive	None	n/a
Turnaround Time	Standard (21 Days)	Standard (21 Days)	n/a
Data Package/QC	Stage 1	Stage 2b	n/a
Number of Samples/Day	8	8	EA
QA/QC			
Secondary Parameters			
Split Samples	1: 10	1: 10	EA
Field Duplicate Samples	1: 10	1: 10	EA
Rinse Blanks (per Round)	1	1	EA
Trip Blanks (per Day)	1	1	EA
Matrix Spikes/Matrix Spike Duplicates	1: 20	1: 20	EA
Data Management			
Secondary Parameters			
Monitoring Plan	Standard	Standard	n/a
Lab Data Review	Stage 2b	Stage 2b	n/a
Submit Data Electronically	Yes	Yes	n/a
Monitoring Reports	Abbreviated	Abbreviated	n/a

Comments: Collect groundwater samples on a quarterly basis during the first year from monitoring wells located downgradient of the capped areas. Collect annual groundwater samples thereafter. Groundwater sampling parameters assumed to consist of volatile organic compounds, Semivolatile organic compounds (1,4-dioxane by single ion monitoring) Cam 17 metals, total dissolved solids, tritium and carbon-14. Collect storm water samples at three locations during two significant storm events per year. Storm water sampling parameters assumed to consist of hardness, metals, mercury, nitrate, nitrite, oil & grease, total organic carbon, total suspended solids and field measurements of pH, electrical conductivity and temperature. Includes data validation, electronic data import, data management and monitoring reports.

Estimate Documentation Report

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: O&M Drainage System
Description: Annual O&M of constructed drainage channels.

Start Date: August, 2010
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: System Defaults

Technology Markups	Markup	% Prime	% Sub.
ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	No	0	0

Total Marked-up Cost: $1,000

Technologies:

Technology Name: **User Defined Estimate (# 1)**
User Name: **ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Model Name		ANNUAL MAINTENANCE OF DRAINAGE CHANNELS (NPV)	n/a
WBS Type		HTRW	n/a
Selected WBS		342.05.08	n/a
Safety Level		D	n/a

Comments: Present value cost for annual O&M of drainage channels. Assume $1,000/year in maintenance for lifetime of alternative. (Cost expressed as annual cost only)

Estimate Documentation Report

Phase Documentation:

Phase Type: Operations & Maintenance
Phase Name: Five-Year Reviews
Description: Five-Year Reviews for all technologies and controls implemented.

Start Date: March, 2015
Labor Rate Group: System Labor Rate
Analysis Rate Group: System Analysis Rate

Phase Markups: Non-Radiological Work_No Owner Costs

Technology Markups	Markup	% Prime	% Sub.
Five-Year Review	Yes	100	0

Total Marked-up Cost: $159,250

Technologies:

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
System Definition			
Required Parameters			
Site Complexity		Low	n/a
Document Review		Yes	n/a
Interviews		Yes	n/a
Site Inspection		Yes	n/a
Report		Yes	n/a
Travel		No	n/a
Rebound Study		No	n/a
Start Date		March-2015	n/a
No. Reviews		6	EA
Document Review			
Required Parameters			
5-Year Review Check List		Yes	n/a
Record of Decision		Yes	n/a
Remedial Action Design & Construction		Yes	n/a
Close-Out Report		Yes	n/a
Operations & Maintenance Manuals & Reports		Yes	n/a
Consent Decree or Settlement Records		Yes	n/a
Groundwater Monitoring & Reports		Yes	n/a
Remedial Action Required		Yes	n/a
Previous 5-Year Review Reports		Yes	n/a
Interviews			
Required Parameters			
Current and Previous Staff Management		Yes	n/a
Community Groups		Yes	n/a
State Contacts		Yes	n/a
Local Government Contacts		Yes	n/a
Operations & Maintenance Contractors		Yes	n/a
PRPs		Yes	n/a
Remedial Design Consultant		Yes	n/a
Site Inspection			
Required Parameters			

Estimate Documentation Report

Technology Name: **Five-Year Review (# 1)**

Description	*Default*	*Value*	*UOM*
Site Inspection			
Required Parameters			
General Site Inspection		Yes	n/a
Containment System Inspection		Yes	n/a
Monitoring Systems Inspection		Yes	n/a
Treatment Systems Inspection		Yes	n/a
Regulatory Compliance		Yes	n/a
Site Visit Documentation (Photos, Diagrams, etc.)		Yes	n/a
Report			
Required Parameters			
Introduction		Yes	n/a
Remedial Objectives		Yes	n/a
ARARs Review		Yes	n/a
Summary of Site Visit		Yes	n/a
Areas of Non Compliance		Yes	n/a
Technology Recommendations		Yes	n/a
Statement of Protectiveness		Yes	n/a
Next Review		Yes	n/a
Implementation Requirements		Yes	n/a

Comments: Inspect landfill areas for performance issues such as erosion or excessive settlement. Review and update all documents associated with compliance, performance, land use controls, and monitoring results. Update/correct remedial program activities, manuals, specifications and record documents. Report the results of the five-year reviews every five years for the lifetime of the alternative.

ATTACHMENT F-10c

ALTERNATIVE SW-10 ASSEMBLY LEVEL REPORT

See file in Appendix F Folder titled 'Attachment_F-10c_SW-10_AssemblyLevelReport.xlsx'